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COVER

Poisoned Tylenol capsules. How to handle a company crisis, page 2. Photo: D. Goldberg/ Sygma

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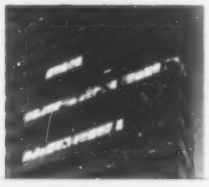

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STRATEGIC RESPONSES TO PUBLIC CONTROVERSY

While there is no quick fix for resolving public crises, history does suggest some definite "dos and don'ts."

By John Holcomb

John Holcomb is an Assistant Professor in the College of Business and Management at the University of Maryland.

In 1973, Abbott Laboratories and Nestle Company were accused of using unethical marketing practices to sell infant formula in Third World countries. Critics claimed these practices, in effect, killed babies by encouraging the misuse of the product.

Since then, both firms have changed their marketing methods, and the public controversy has subsided.

What did the conflict cost the companies? It cost Abbott relatively little. Abbott lost no market share and emerged with high public credibility.

In contrast, Nestle's initial costs were high—in terms of both money and credibility. Unlike Abbott, Nestle faced a seven-year international boycott of its products which may have cost the company $40 million.

Why the difference? How did the firms respond to these public charges? Does one strategic approach work better than others in coping with political crises? Is there an historical pattern from which other companies can learn?

To try to answer these questions, I examined 15 cases[1] in which firms or industries handled political controversies caused by industrial accidents, product failures or environmental catastrophes. Six cases are presented here.

For each case, I determined how the company involved undertook seven strategic steps:

- Ascertaining the facts
- Portraying the problem
- Assessing the blame
- Responding to critics
- Adopting policy changes
- Instituting new procedures
- Choosing political tactics

Then, in light of the steps taken, I looked at what the controversy had cost the company in money and credibility.

What I found, in short, is that there is no quick fix for resolving political conflict. As I discovered, strategic responses fell into two distinct patterns. The first pattern correlated with high costs, as exemplified by Hooker Chemical Company, Firestone Tire and Rubber Company, and A. H. Robins Company, and the second pattern with medium to low costs, as experienced by Johnson & Johnson Company, Abbott Laboratories, and Nestle Company.

Hooker Chemical: Love Canal

More than 1,000 New York families were evacuated permanently when toxic wastes escaped from the Love Canal disposal site. The leaks brought a surge of medical problems, including birth defects, miscarriages, cancers, deafness, brain and nervous system dysfunctions, and severe headaches, when people breathed or came in skin contact with the chemicals.

The toxic waste crisis at Love Canal provides an example of the high-cost response pattern. The exposure of residents of Niagara Falls, New York, to 80 different chemical compounds leaking from the canal, a toxic waste dump once owned by Hooker Chemical Company, came to light in 1978. The *Wall Street Journal* reported that two years elapsed before Hooker Chemical offered its version of what happened. A senior vice president said it took that long to dig out the data and that "we

(c) Bettmann Newsphotos

Employee in Denver drug store pulls Tylenol from shelf after Chicago deaths.

Hooker may have been aware of the toxic hazards as early as 1958 . . .

were afraid to say anything that would turn out to be incorrect."[2]

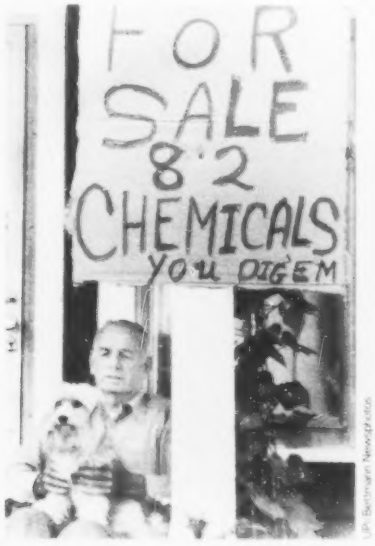
In 1979, a year before the company presented its position, evidence emerged during a takeover battle that Hooker may have been aware of the toxic hazards as early as 1958, when children at the 99th Street Elementary School were burned by chemicals leaking on the playground. Hooker says it warned the local school board about this problem at the time, however, and that the situation was quite distinct from the larger problem of chemical migration.

Though the company had taken certain precautions before deeding the Love Canal property to the school board to build the school, it finally maintained, in 1980, that the fundamental problem could not have been known. The president of Hooker Chemical stated before the Commonwealth Club of San Francisco, "It is not fair to judge this or any other industry using today's standards applied to past practices or for not knowing what was unknowable at the time."[3]

Whatever Hooker's knowledge of the danger, within a month of its president's speech, the State of New York sued the company for negligence in failing to prevent migration of waste and in failing to warn the public of the hazards.

After taking so long to investigate and acknowledge the extent of the problem at Love Canal, Hooker Chemical also denied that the chemicals harmed anyone's health. Hooker's president stated, "The fact is that there is simply no reliable evidence to support the allegations of widespread health problems resulting from exposure to chemicals from Love Canal."[4] Furthermore, when a study commissioned by the Environmental Protection Agency found chromosome damage among Love Canal residents, Hooker responded that the study was "poorly conceived and executed" and that the "precipitous and poorly handled release" of the data caused "panic" among the residents, creating the need for their relocation.

While denying the seriousness of the situation, Hooker also denied responsibility for it. It instead blamed the local government and school board. In the



UPI Bettmann Newsphotos

Chemicals from Love Canal leaked into Tim Moriarty's basement.

UPI Bettmann Newsphotos

Robert Knott and family carry items from Niagara Falls home in which they may never live again.

deed passing the property to the school board in 1953, a provision stipulated that the board would assume the risk of any liability that might arise from its use of the property. Hooker argued that the design of the disposal site was well within existing federal standards and that the soil with which it was covered prior to the transfer was later disturbed.

A task force of the American Institute of Chemical Engineers concluded that the resulting predicament at Love Canal could be attributed to three factors: lack of monitoring of the site after it passed from control of Hooker, subsequent invasion of the site during nearby construction, and lack of remedial work after the site was disturbed.

The school board countered that Hooker never adequately warned the community of the nature of the hazards of the land it was donating.

Portraying the problem as not particularly serious and shifting blame to others led Hooker to a posture of self-defense toward its critics and various levels of government. The State of New York, the City of Niagara Falls, Niagara County, and the city's Board of Education sued Hooker, and Hooker sued them back. However, the company did not pursue the litigation to the very end, instead settling the federal and state lawsuits out of court in 1981. In exchange for dropping more than $600 million in damage claims against it, Hooker agreed both to create a plan for containing and cleaning up the 21,000 tons of waste at the landfill and to monitor the site for 35 years.

The company had made some conciliatory gestures earlier as well. In 1978, Hooker offered to pay one-third of the cost of a consultant's plan to solve the leachate problems, but the rest of the money was not forthcoming from the city and state. Regarding the lawsuits by 1,300 individuals against Hooker, the company settled those out of court as well, contributing $6 million to a settlement fund for area residents.

Though Hooker's short-run response was not especially novel, the company did institute an internal change, establishing a board of directors committee to monitor the impacts of its chemical products. Its use of political tactics, however, was quite conventional. Beyond its response to lawsuits, Hooker also made use of defensive political advertising.

Hooker handled this crisis at

The toxic waste crisis left a ghost town.

UPI Bettmann Newsphotos

Members of Congress examine damaged Firestone tire during hearing.

high cost to the firm and emerged with low credibility. Though it settled the lawsuits against it at minimal expense, its business performance was affected, with earnings down for three straight years from 1977 to 1979. Two books on Love Canal were written, both critical of Hooker and of the government.[5] Newspaper articles have continued to appear about Love Canal, one in 1984 stating New York officials still warn that the area is not safe enough for residents to resettle in the community. Meanwhile, the transfer of waste from Love Canal to another Niagara Falls site has contributed to the creation of another disposal problem.

The Hooker case not only put toxic waste on the front page, but also entrenched its hazards in the public mind. The broader impact was great. Love Canal was the major incident precipitating the passage of the chemical Superfund legislation in 1980, the provisions of which are again being debated in 1985. In effect, the Hooker case helped create the toxic waste issue that every chemical company and public official are now confronting.

Firestone: 500 Radial Tire

Blowouts, tread separations, hundreds of auto accidents, and at least 34 deaths were attributed to deformities in Firestone's model 500 series radial tire in 1978.

While Hooker Chemical Company failed to assess the dangers at Love Canal immediately, Firestone Tire and Rubber Company went even further to downplay the poor safety record of its model 500 steel-belted radial tire. Firestone actively resisted the federal government's requests to disclose such information. *Fortune* reported that when the National Highway Traffic Safety Administration (NHTSA) requested copies of consumer complaints of tire failure, Firestone insisted it could not supply the data without spending many months researching and compiling it.[6]

Meanwhile, the company kept maintaining that the tire was safe and that information criticizing the tire was inaccurate. Claiming NHTSA survey results to be unscientific, Firestone even sought a restraining order from a federal district court to keep the facts from the public.

While Firestone said the problems with the 500 tire were exaggerated, it blamed the consumer for those failures that did occur. Careless driving and failing to check tire pressure caused the problems, according to the company, despite survey results to the contrary from the Center for Auto Safety, a public interest group.

Furthermore, Firestone accused its critics of making a mountain out of a molehill. The company saw itself as the victim of a "Naderite conspiracy," in the words of the *Fortune* writer. The Center for Auto Safety, which collected consumer complaints about the tire, was originally a Ralph Nader organization. What's more, Joan Claybrook, head of NHTSA at the time, was

The company kept maintaining that the tire was safe.

a Nader associate who is now back working for Public Citizen, Nader's umbrella group. Also, a key staff member of a U.S. House Commerce subcommittee who participated in the Firestone investigation is a former Nader associate.

Firestone also went beyond the posture of self-defense assumed by Hooker Chemical and initially engaged in more open confrontation with the government and other critics. Whether the enemy was NHTSA, the Congress or the "Naderites," the company's response took a hard line.[7]

Likewise, Firestone was even less willing than Hooker Chemical to adopt any policy change. In fact, after John J. Nevin became president of Firestone in 1979, he himself criticized the company for failing to voluntarily recall the 15 million tires before the government ordered that action in 1978. Since 15 to 20 percent of the tires developed structural problems, consumers and the government had adequate cause for alarm. Nevin said a voluntary recall would have prevented the company's image from becoming tarnished.[8]

In contrast, the tire industry at large did institute new internal procedures in the wake of the Firestone upheaval. Quality control was improved; for example, tires were X-rayed as they came off the production line.

After initially taking a confrontational stance, Firestone followed up with commonplace political tactics. It lobbied directly before Congress and NHTSA, insisting throughout that its radial tire was perfectly safe.

Although the cost to Firestone was not as high as it was to Hooker Chemical, it was still high. The company lost some of its share of the radial tire market, to the tune of "scores of millions of dollars" in sales, according to *Fortune*. Moreover, Firestone lost long-term repeat business—a survey by the Center for Auto Safety revealed that consumers with complaints would not repurchase from the company in the future. The company was also hit with 250 consumer lawsuits and eventually had to absorb the cost of the forced recall as well.

Partially as a result of the controversy, Firestone was "in desperate trouble," according to one business reporter, when Nevin took the helm. The new president, during 1980, led a dramatic turnaround in the company's performance, raising plant capacity utilization from 57 percent to nearly 90 percent, following austerity measures.

Clearly, a voluntary recall would have saved the company money and time. It also could have saved the company a loss of public acceptance. Even though the case didn't make the same long-lasting impression in the public mind as the Love Canal issue, Firestone was heavily criticized for the way it handled the case, even in the business press. The impact on the rest of the industry was minimal. All radial tires were not under attack as unsafe, only the Firestone 500. In fact, other tire companies gained, as Firestone's market share slipped.

A. H. Robins: Dalkon Shield

Over 12,000 women have sued A. H. Robins Company for pelvic infections, miscarriages, sterility, and deaths caused by the Dalkon Shield intrauterine device (IUD). Robins marketed the birth control product between 1972 and 1974.

Like Firestone, A. H. Robins Company attempted to suppress evidence questioning the safety of its Dalkon Shield. Initially, the company was passive in investigating the potential side effects of the IUD, even after buying the rights from the inventors in 1970. In fact, the company did not even have an obstetrician or gynecologist on its staff at the time.

Yet even as Robins readied the device for market, it acquired some information on the IUD's tendency to attract bacteria, an effect later implicated in many health problems and fatalities. The device's tendency to act as a bacterial "wick", according to *Forbes*, was reported in an internal memo five months before sales began, but the danger was not actively investigated by the company.[9] A year later, a quality control supervisor reported test results showing the same tendency, and he was fired. Moreover, the company failed to take any action based on the mounting criticism it began to receive from physicians as early as 1971, though it finally did commission studies and a conference while continuing to promote the IUD aggressively.

Robins never accepted any responsibility . . .

Robins did stop selling the IUD in 1974. But even after thousands of lawsuits and further steps to withdraw Dalkon Shields from use, the company still maintains the product is safe. Despite the IUD's unique design and its resultant problems, Robins' president stated in October 1984, "Our company has never viewed the Dalkon Shield as posing any risk higher than that associated with other IUDs."[10]

A. H. Robins has not blamed others for the controversy, as did Firestone and Hooker Chemical. There really were not other convenient parties to blame. As a legal tactic, though, Robins did question in some of the lawsuits whether the miscarriages might have been caused by other factors and whether the sexual activities of the plaintiffs might have caused the infections. In any case, despite its failure to conduct adequate safety tests before marketing the Dalkon Shield, Robins never accepted any responsibility itself for the problems attributed to its product.

Naturally the company assumed a defensive posture in the court cases. Still, some of its legal tactics bordered between simple self-defense and aggressive confrontation. For instance, even after the company stopped distributing all promotional literature for the Dalkon Shield in early 1974, it delayed taking the product off the market until later in the year for fear the action would look like a confession of liability, hurting it in the 47 lawsuits then pending. In addition, Robins' vice president and general counsel allegedly ordered the destruction of "legally damning" documents by a staff attorney during a 1975 trial.[11]

In a similarly defensive vein, in 1984 the company unsuccessfully lobbied for an amendment to the proposed Uniform Products Liability Act that would drastically reduce a company's liability to punitive damages in suits filed by consumers. Even Congressional supporters of the bill objected to the radical amendment, since it endangered the chances for overall passage; the bill was defeated.

Ten years after taking the IUD out of circulation in 1974, Robins finally adopted a policy change on the product, although it still defended the integrity of the Dalkon Shield. On October 30, 1984, Robins announced a program to pay doctors and clinics for medical examinations and the removal of any Shields from women still using them; print and television advertising has been spreading the word on the "recall." Otherwise, there is no evidence that Robins instituted any change in its decision-making structure or procedures following the controversy.

Ten years after... Robins "recalls" its product.

An Important Health Warning To Women Using An IUD

If you are still using an intrauterine birth control device (IUD) inserted in the early to mid 1970s, this message is for you. Many women had an IUD called the Dalkon Shield inserted during that time. It is important that each Dalkon Shield be removed, since there is substantial medical opinion that its continued use may pose a serious personal health hazard. If you are still using a Dalkon Shield, A. H. Robins Company will pay your doctor or clinic to remove it.

A. H. Robins ceased distribution of the Dalkon Shield in 1974. Many claims have been made that the device causes health problems, including pelvic infections, that may result in serious injury or death. In 1980, A. H. Robins advised doctors to remove the Dalkon Shield from any woman still using it. In 1983, the U.S. Food and Drug Administration and other government agencies issued the same advice based on their concern about pelvic infections among Dalkon Shield users.

The Dalkon Shield

A. H. Robins will pay your doctor or clinic for any examination needed to find out if you are using the Dalkon Shield. If you are, A. H. Robins will pay the cost of having it removed.

WHAT TO DO

If you know you are using a Dalkon Shield IUD, or if you are using an IUD inserted in the early to mid 1970s and are unsure of the kind, call your doctor or health clinic for an appointment. Your call will be in confidence, and there will be no cost to you.

If you have further questions, please call A. H. Robins Company toll free. The number is **1-800-247-7220**. (In Virginia call collect **804-257-2015**.)

A·H·ROBINS

[illegible] Cummings Drive, Richmond, Virginia 23220

Table 1

Strategic Responses to Public Controversy

Company	Ascertaining the Facts	Portraying the Problem	Assessing the Blame	Responding to Critics	Adopting Policy Changes	Instituting New Procedures	Choosing Political Tactics	Costs in Money/ Credibility
Johnson & Johnson (Tylenol poisonings in 1982)	Internal tests	Serious problem	Blame others	Collaborate	Unilateral change	None	Ads, Self-reg	Low/Low
Abbott (Effects of infant formula marketing practices since 1973)	Internal & external tests	Serious problem	Limited acceptance	Collaborate	Unilateral change	Code of conduct, Decision structures	Self-reg., Negotiation	Low/Low
Nestle (Boycott and protest over infant formula sales since 1973)	Inactive	No problem	Blame others	Confront, Collaborate	Industry-wide change	Code of conduct, Decision structures	Industry self-reg., Negotiation	Med/Med
Hooker (Health effects of toxic waste at Love Canal since 1978)	Inactive	No problem	Blame others	Self-defense	No change	Decision structures	Ads, Litigation	High/High
Firestone (Forced recall of 500 radial tire since 1978)	Suppressed	No problem	Blame others	Confront	No change	Testing	Lobbying	High/High
A. H. Robins (Product liability suits against Dalkon Shield IUD, marketed 1972-74)	Suppressed	No problem	No blame	Confront	No change	None	Ads, Litigation	High/High

In launching the program, the company said it acted out of concern for the health of remaining Shield wearers and out of unwarranted adverse publicity. Miles Lord, the federal district court judge who heavily criticized Robins in 1984, disagrees, charging the action is an attempt to save the company money in the future and does not look beyond the bottom line.

The company resorted only to conventional lobbying and litigation tactics to defend itself. In fact, its aggressive stance on litigation prevented it from negotiating out-of-court settlements to the extent that Hooker Chemical did, at least until late in the game.

The cost of the controversy and the resulting litigation has been high. The 8,300 suits that have been settled to date cost the company and its insurer nearly $315 million. There are still 3,800 suits pending, and more are being filed at the rate of ten a day. A consultant's study projects another 8,300 cases could be filed before the Dalkon Shield episode is finally over. The average settlement has increased from $8,000 in 1976 to $35,000 in 1983, and in 1984 Robins paid $78 million in litigation expenses not covered by its insurance.

Johnson & Johnson has received accolades from the media, consumers, and the investment community.

The biggest expense of the controversy is a special "reserve fund" of $615 million that the company established in April 1985 to meet the "minimum" legal expenses it may face in the future. Despite the company's record year in sales and earnings in 1984, the reserve fund created a net loss of over $460 million, and it will prevent Robins from paying any dividends for the next two years.[12] Moreover, the reserve fund does not cover any punitive damages. In one Dalkon Shield case, a Denver jury awarded $6.8 million to a plaintiff, mostly in punitive damages.

There have been other financial expenses as well. Robins established a separate $6.9 million fund to reimburse any shareholders who bought company stock between 1971 and 1974. It also paid out $4.5 million for its new publicity campaign urging any woman using the Dalkon Shield to have it removed. The company has paid $1.1 million so far in removal expenses.

The controversy has also lowered employee morale and hurt the company's public image. The outcome has certainly been one of high cost and low credibility, although it took many years for the litigation to have an adverse impact on the company's income. An earlier voluntary recall might have cut Robins' losses substantially.

Johnson & Johnson: Tylenol

Seven people in the Chicago area died after swallowing Tylenol capsules that a saboteur had laced with cyanide.

In contrast to the ways in which Hooker Chemical, Firestone, and A. H. Robins handled their problems, Johnson & Johnson Company followed the low-cost response pattern in coping with the crisis arising from poisoned Tylenol capsules in Chicago, Illinois, in 1982.

Johnson & Johnson immediately launched an investigation to ascertain and assess the facts. It shut down its plants and warehouses and had trained dogs sniff for adulterated products. The company also offered a $100,000 reward for information about sabotage.

In this case, Johnson & Johnson admitted that a serious problem existed. Because it was able to establish that the pain-relief medication had been adulterated outside the company's production and distribution process, the company's self-interest was not hurt by acknowledging the seriousness of the situation. Since the incident clearly emerged as sabotage, the company was also a victim, and allocation of blame was not even an issue.

Rather than assuming a posture of confrontation or self-defense, Johnson & Johnson collaborated with the government and other parties, making this case a model of openness and honesty. The company cooperated fully with the Chicago police and with the Food and Drug Administration (FDA). The company hired an attorney in Chicago to work with the authorities and urged FDA to institute tamper-resistant packaging as a national industry-wide requirement. Johnson & Johnson was also open with the press and its own employees about the controversy, keeping them informed as events unfolded.

The policy changes adopted by Johnson & Johnson as the crisis broke were prompt and dramatic. The company launched an immediate and voluntary nationwide recall of all Tylenol capsules, then quickly developed and advocated the use of tamper-resistant packages. The fact that Johnson & Johnson instituted no changes in its internal procedures or decision-making mechanisms following the Tylenol crisis is really a reflection of the effectiveness of its existing systems. There was simply no need for improvement.

While voluntary self-regulation was Johnson & Johnson's primary tactic, it also used advertising as a supplement. But the advertising was not of the defensive sort used in other cases. Hooker Chemical had purchased full-page print ads explaining how it was not responsible for the Love Canal tragedy. Ten years after marketing the Dalkon Shield, A. H. Robins advertised to warn women to have the IUD removed. Meanwhile, Johnson & Johnson helped save the image of Tylenol with a series of trust-building ads in October and December 1982. The company also ran advertisements offering consumers $2.50 coupons to encourage the purchase of Tylenol.

In contrast to the other product failures, the Tylenol recall was a success. The withdrawal

and disposal of the medication did result in an extraordinary after-tax cost of $50 million, or 22¢ per share, but the benefits were far greater. Johnson & Johnson suffered no long-term decline in its market share, as otherwise most assuredly would have occurred. Its market share did fall from 37 percent to 7 percent after the seven Tylenol deaths, but due to its prompt and responsible handling of the controversy and to its coupon program, the company's market share quickly rebounded to 30 percent and has grown ever since.

Moreover, Johnson & Johnson has received accolades from the media, consumers, and the investment community for its actions. Surveys showed that 90 percent of consumers did not blame the company for the Tylenol deaths. As a *Washington Post* reporter concluded, "Serving the public interest has simultaneously saved the company's reputation."[13] Johnson & Johnson handled the Tylenol controversy at reasonably low cost and emerged with high credibility.

To date, however, the identity of the saboteur is still a mystery.

Abbott and Nestle: Infant Formula

Many poor, uneducated mothers in African countries gave up breast-feeding their babies in response to several companies' heavy promotion of infant formula as a more modern, sophisticated feeding technique. Without adequate instructions on how to use the formula, mothers often overdiluted the concentrated liquid and/or mixed it with polluted water. Untold numbers of babies became malnourished and died as a result.

In the early 1970s, health experts and religious groups charged Abbott Laboratories and Nestle Company, producers of infant formula, with unethical marketing practices. Their sales methods allegedly caused the misuse of infant formula in Third World countries, primarily in Africa, thereby leading to the malnutrition and deaths of babies.

Nestle Company initially resisted taking any action and attacked the integrity of its critics, a strategy which led to an international boycott of Nestle products. Meanwhile, Abbott Laboratories internally investigated both the marketing practices of the entire industry and the issue of infant malnutrition in Third World nations. Though it concluded that baby formula had a more beneficial impact than its critics portrayed, Abbott acknowledged that industry promotion posed a problem, even though Abbott was not implicated in aggressive marketing to

Johnson & Johnson cooperated with Chicago police and the FDA.

Union Carbide, Bhopal, India

It has been called the world's worst industrial disaster. On December 3, 1984, deadly methyl isocyanate gas leaked from a Union Carbide Corporation chemical plant in Bhopal, India, and soon killed 2,000 people and injured up to 200,000. Methyl isocyanate (MIC) is used in the manufacture of pesticides.

Union Carbide Corporation owns 51 percent of the Bhopal plant, with Union Carbide India Limited (UCIL) owning 49 percent.

Union Carbide made immediate moves to ascertain the facts of the tragedy. It certainly took the situation seriously, but did not say who it thought was ultimately to blame. Chairman Warren M. Anderson, however, said local managers were responsible for the Bhopal plant's maintenance and safety. Nevertheless, the day of the leak, Union Carbide halted MIC production in Bhopal and at a similar facility in West Virginia. Since then, some corporate policy changes have taken place as well as a number of defensive political tactics. Management has indicated an interest in settling claims out of court.

But a larger question has emerged that may cloud the legal picture for some time. This question is whether multinational corporations like Union Carbide are liable for subsidiary operations in Third World countries, particularly where hazardous activities are involved.

How will the controversy end? What will it cost Union Carbide? The following brief chronology shows the course of events thus far.

Reuters/Bettmann Newsphotos

Reuters/Bettmann Newsphotos

Bhopal clinic gives free medicine to residents affected by poison gas.

December 3, 1984
- Poisonous methyl isocyanate (MIC) gas leaks from Bhopal plant.
- 300 people reported dead.
- Operations shut down at Bhopal and at Institute, West Virginia.
- Carbide headquarters calls press conference to acknowledge disaster but does not speculate on cause.
- Voluntary safety inspection launched at West Virginia facility.

December 4, 1984
- Carbide's chairman Anderson and fact-finding team depart for India.
- Carbide announces intent to determine cause of accident, to aid victims, and to prevent further danger.

December 5, 1984
- Carbide president Alec Flamm briefs headquarters employees.
- Carbide stock plunges more than $10 a share to $38.75.
- Bhopal death toll hits 1,600.

December 6, 1984
- First damage suit filed in West Virginia.
- Anderson and team arrive in India.
- Carbide denies rumors of previous multiple deaths at Bhopal and of impending financial ruin because of tragedy.

December 8, 1984
- Anderson and Indian government officials in New Delhi discuss relief and compensation for victims.

December 9, 1984
- Anderson briefs Carbide headquarters employees.

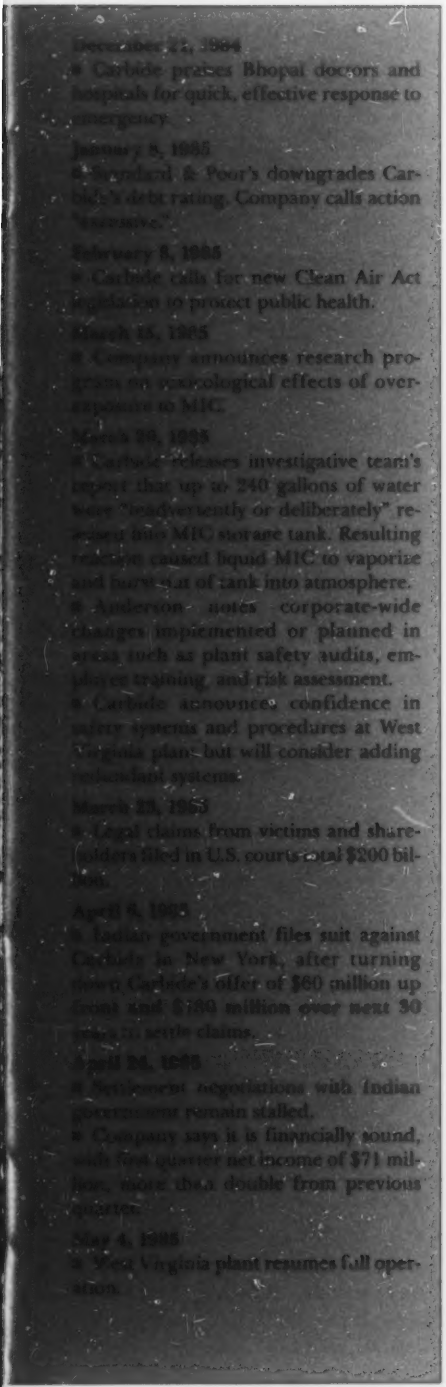
December 10, 1984
- Carbide volunteers additional $1 million for UCIL's $840,000 short-term emergency relief fund.

December 13, 1984
- In-transit international shipments of MIC recalled voluntarily by Carbide.

December 14, 1984
- Anderson testifies before two subcommittees of U.S. House Energy & Commerce Committee on company's actions since 12/3.

December 18, 1984
- Most of remaining MIC at Bhopal plant safely converted into finished pesticide.

Abbott cooperated and negotiated with its critics . . .


December 23, 1984
• Carbide praises Bhopal doctors and hospitals for quick, effective response to emergency.
January 8, 1985
• Standard & Poor's downgrades Carbide's debt rating. Company calls action "premature."
February 8, 1985
• Carbide calls for new Clean Air Act legislation to protect public health.
March 15, 1985
• Company announces research program on toxicological effects of over-exposure to MIC.
March 30, 1985
• Carbide releases investigative team's report that up to 240 gallons of water were "inadvertently or deliberately" re-entered into MIC storage tank. Resulting reaction caused liquid MIC to vaporize and burst out of tank into atmosphere.
• Anderson notes corporate-wide changes implemented or planned in areas such as plant safety audits, employee training, and risk assessment.
• Carbide announces confidence in safety systems and procedures at West Virginia plant but will consider adding redundant systems.
March 23, 1985
• Legal claims from victims and shareholders filed in U.S. courts total $200 billion.
April 8, 1985
• Indian government files suit against Carbide in New York, after turning down Carbide's offer of $60 million up front and $180 million over next 30 years to settle claims.
April 24, 1985
• Settlement negotiations with Indian government remain stalled.
• Company says it is financially sound, with first quarter net income of $71 million, more than double from previous quarter.
May 4, 1985
• West Virginia plant resumes full operation.

the extent Nestle was.[14]

Abbott, a medical and pharmaceutical company, marketed through doctors and other health professionals while Nestle, a food company, marketed directly to mothers—often using Nestle employees dressed as "mother-craft" nurses to sell formula in hospitals and homes. Nestle portrayed itself as the victim of an activist group campaign to create an issue; Abbott admitted promotional deficiencies and recognized that the industry must shoulder much of the blame.

Throughout the first ten years of the infant formula debate, Nestle assumed a posture of confrontation toward its critics. In 1974, Nestle filed a libel suit against the Third World Working Group, a Swiss citizens' action organization, for a pamphlet it published titled "Nestle Kills Babies." An organization supported by Nestle also commissioned an article that appeared in *Fortune* called "The Corporation Haters" that attacked legitimate scholars studying the controversy and labelled religious organizations "Marxists marching under the banner of Christ."[15]

On the other hand, Abbott cooperated and negotiated with its critics. The primary protest and criticism Abbott faced came in the form of shareholder resolutions proposed by dissident church groups. The company negotiated a withdrawal of a resolution submitted by the Interfaith Center for Corporate Responsibility in 1977 by giving the group an opportunity to state its position to company shareholders in the house organ. As time went on, the critics were favorably impressed with some of Abbott's policy changes and with its enforcement of these changes.

Not until 1981 did Nestle collaborate with outside groups, a dramatic reversal from its previous stance. It sought out an ethical group that was "honestly investigating the issue" with which it could work in complying with a World Health Organization (WHO) marketing code that Nestle had endorsed. It chose the Methodist Task Force on Infant Formula, most of whose members were already boycotting Nestle. The company had also worked with its critics in developing the code.

Meanwhile, Abbott adopted new marketing policies, reducing the aggressiveness of its sales in the Third World and ensuring the safe use of formula. In so doing, Abbott distinctly chose a unilateral approach, since the International Council of Infant Food Industries (ICIFI), in writing its code, rejected the industry-wide initiatives Abbott originally wanted to pursue. Now in the late stages of the infant formula controversy, Nestle also is advocating changes of an industry-wide nature. By supporting the WHO code, Nestle wants to bind the entire industry to international marketing standards.

Abbott and Nestle also instituted structural innovations in response to the infant formula issue. Abbott formed a permanent management work team to study infant nutrition, infant

E. Schwab/WHO

Infant formula manufacturers pressured many African mothers to give up breastfeeding.

formula, breastfeeding, and related matters in the Third World. Nestle also finally adopted a new organizational structure. In May 1982, it established a ten-member panel of scientists, clergy, and ethicists to monitor Nestle's compliance with the WHO code and to investigate complaints against its marketing practices. Called the Nestle Infant Formula Audit Commission, its chairman is former Secretary of State Edmund S. Muskie.

Regarding political tactics, both Abbott and Nestle practiced self-regulation combined with coalitions and negotiation with their critics. However, while Abbott pursued these tactics from the outset, Nestle did so only in the late stages of the controversy, after learning some early lessons.

In handling the infant formula controversy, Abbott absorbed minimal financial cost in changing its promotional practices and adopting a new marketing code. It lost no market share and emerged with high credibility, especially in contrast to the standard ways in which the rest of the industry reacted. Moreover, Abbott's voluntary marketing code and collaborative dealings with church groups may have prevented a boycott like the one Nestle faced.

Some estimates place the damage of the boycott to Nestle at up to $40 million. Other estimates maintain the boycott had virtually no effect. Beyond the immediate dollar costs, the protest and boycott undeniably consumed a large amount of executive time and attention. Nestle's response to the protest through the first eight years brought it low credibility, especially in the eyes of public officials, church activist groups, and the business press. However, the company's turnaround and collaborative dealings after 1981 eventually returned it to a high level of credibility.

Nestle's experience with the infant formula controversy and the ensuing boycott may be instructive for other firms and industries. Nestle mishandled the case for eight to ten years, which is an all too common scenario, and then reversed its course with some bold moves. After first denying or ignoring the problem of infant mortality, then blaming the controversy on church activists and labeling them Marxists, Nestle finally adopted a new strategy. With the advice of a full-time public affairs consultant experienced in food industry issues, the company organized the Nestle Coordination Center for Nutrition and began a series of initiatives. These initiatives included seeking out responsible activist groups with whom the company could work, endorsing the WHO code, and organizing an audit commission to ensure Nestle's compliance with the code.

The result? In early October 1984, the International Nestle Boycott Committee, "recognizing the substantial progress Nestle has made," announced the end of the boycott. Hence, a case that began in battle was resolved through collaboration and voluntary self-regulation.

Dos and Don'ts

The final question is—what works and what doesn't? Can we generalize? As these six cases demonstrate, and as supported by the larger study, public controversies usually are resolved most successfully—that is, with the lowest cost in money and credibility—if the company involved thoroughly investigates the facts, portrays the situation as serious, accepts some of the blame if guilty, and collaborates with its critics in solving the problem.

Table 1, ranking each company by its success and summarizing the strategic steps it took, bears out this generalization. The companies with the lowest costs, Johnson & Johnson and Abbott Laboratories, actively pursued the facts of the matter, characterized the problem as serious, collaborated with their critics, and changed their policies. Johnson & Johnson did blame others for the problem, but rightly so; Abbott accepted some of the blame for the infant formula controversy.

The remaining companies either failed to ascertain the facts or actively suppressed them. Likewise, they denied the existence of the problem and, with only one exception, eventually blamed others for it. They also tended to fight their critics rather than collaborate with them and to adopt no change in their policies.

The relationship between the tactics used in the final two steps—instituting new procedures and choosing political tactics—and the ultimate cost of the controversy to the company is less clear. There is no quick fix here. Procedural changes do not guarantee success. Similarly, the mix of political tactics might be different from one case to another. Political or issue advertising might or might not be helpful, although it seems to be more effective in explaining voluntary initiatives (e.g., the Tylenol ads) than in explaining a defensive position (e.g., the Hooker Chemical ads). Likewise, lobbying may or may not be useful.

Thus, from this study, it is more apparent which strategy to avoid than which to take. While there is no strategy that guarantees success, there is one that will virtually guarantee failure—suppressing the facts, denying the problem, confronting critics, making no policy changes, and attempting to resolve the controversy through litigation. In fact, if there is one single tactic to avoid, it is endless litigation. Companies that choose this path wind up perpetuating their problems, with the inevitable heavy toll in both money and credibility. EP

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ECONOMIC DEVELOPMENT— A RISING TIDE

Utility efforts to spur local development benefit the entire community.

By Doris Newcomb

Doris Newcomb is a freelance writer specializing in energy-related topics.

The central business district of Macon, Georgia, was once the primary location for the area's commercial establishments and financial, service, and governmental institutions. By the mid-1970s, however, its buildings and facilities had deteriorated. Retail customers were flocking to suburban shopping centers. Many stores moved out.

Downtown Macon's fate was shared by many other similar areas in cities nationwide. The growth in suburban residential areas prompted many businesses to leave, and inadequate financial investments made it impossible to maintain buildings properly.

But today, downtown Macon again is a busy, attractive part of the city, thanks in part to Georgia Power Company, which played a major role in a downtown revitalization effort.

Macon is one of eight medium-sized cities Georgia Power Company has targeted for downtown revitalization assistance as part of its community development program. "We recognize that we are in fact partners with the community and that we have a franchise to serve it," explains David Norman, manager of the company's Community Development Department.

Georgia Power's assistance includes direct improvement services as well as marketing efforts such as the nationwide "Downtown Georgia" advertising campaign to recruit businesses into central business districts. "The typical community development department is strictly in the marketing business—selling prospects to come into the community—but they can only sell a community to the extent that it is saleable," Norman says. "Our department is in the 'product development' business; our goal is to improve communities so they'll be more attractive for investment."

The Past Revisited

Until the 1973 oil embargo, most utilities actively promoted increased electricity use, conducting extensive advertising campaigns and other programs to encourage economic growth—and corresponding load growth—in their service areas. Many of the new generating units constructed to meet the steadily growing electricity demand were more efficient, reducing the cost of producing electricity and helping utilities keep rates stable.

After the embargo, however, many companies, faced not only with skyrocketing fuel costs but also with precipitous interest rates and proliferating regulatory constraints, cut back on promotional advertising and traditional economic development activities. Their focus shifted to conservation programs to help customers cope with rising electricity costs by reducing their consumption.

During these recessionary years, the economic health of many communities declined, particularly those in areas where sharp cutbacks in industrial production caused large numbers of layoffs. As a result, by the late 1970s many utilities were left with relatively large capacity reserve margins and underutilized facilities and equipment, lowering the efficiency of operations and forcing them to seek higher rates to cover fixed costs.

Consolidated Edison Company of New York

The Royal Ink Corporation of America was Con Ed's 2000th customer to qualify for a special electric rate.

Utility contributions to economic development can help stop the downward spiral . . .

To spur the commercial and industrial growth needed to revitalize their communities, utilities are turning again to economic development programs. Notes Bill Prindle, EEI Manager of Commercial/Industrial Programs, "In light of recent recessionary problems and load flattening caused by conservation, it's become apparent to utilities that they can't count on more people hooking up automatically, and that the key driver in economic development is jobs."

A utility company can affect the growth of its market in only two ways—by competing with other energy suppliers and by expanding the rate of economic activity. The first method, competing for an energy dollar that is split between electricity, gas, and oil, "is a grim and deadly battle in which somebody's going to lose," Prindle explains. The second, encouraging economic development, is not a zero-sum game. It operates like "a rising tide (that) lifts all boats," creating more jobs, a stronger tax base, and the means for a utility to improve its earnings while holding down rate increases.

In economically depressed areas, Prindle notes, utility contributions to economic development can help stop the downward spiral that occurs when electricity consumption drops and rates must increase to cover fixed costs, further decreasing customers' ability to purchase electricity. "By building on a community's remaining strengths, a utility can attract new economic activity, and all of a sudden you're in an upward spiral as more jobs are created and more people are available to share fixed costs," he says.

To create more job-producing enterprises in their service territories, utilities can attract outside employers, help start small growth businesses or get existing employers to expand their operations. A specific utility's approach, according to Prindle, depends largely on local conditions. For example, the major focus in the industrial Northeast—an area hard hit by the recession—is job retention. In the Southeast, a region that suffered less severely, the emphasis is on job growth.

The utilities with the greatest motivation to pursue economic development are those with excess capacity, notes Prindle. Utilities with relatively small reserve margins must encourage growth selectively to avoid increasing peak loads. Instead of seeking increased electricity demand, these utilities focus on improving their capacity factors by encouraging increased electricity use during off-peak periods.

Georgia Power turned Macon's historic railroad terminal into new economic life for Cherry Street.

Georgia Power Company

Revitalizing Macon

In Macon, Georgia Power Company's revitalization efforts began in the mid-1970s when it formulated a proposal to purchase and renovate a historic railroad terminal that was a major component in the city's rehabilitation plan. The city had purchased the terminal after Southern Railway moved its offices out in the early 1970s, leaving the terminal vacant. Under Georgia Power's proposal, the utility promised to develop the building by using part for its Macon Division offices and the rest for commercial space if the city and other businesses continued to improve surrounding areas along Cherry Street.

After the city accepted the utility's offer in 1981, Georgia Power included Macon in its pilot commercial development program for helping cities attract commerce to central business districts. The tools used to accomplish this goal included advertising, promotion, marketing, and the placement of tenants in various buildings. The company renovated the old railroad terminal and devised a plan for managing the revitalized area to attract customers. Today, the Cherry Street area is an attractive center for shopping and entertainment. Many specialty stores have moved into the area, and property values have increased.

The Community Development staff at Georgia Power includes an urban designer, an architect with a background in historic preservation, an urban economist, urban planners, and a former city administrator. Together, they provide businesses and local governments with a

Showing owners the advantages of rehabilitating buildings is a special Georgia Power service.

Georgia Power Company

wide range of direct services. For example, in one program focused on the advantages of rehabilitating a building, staff members use a special computer program to show property owners what the income would be from various investments. The staff also acts as a "resource broker," directing those who need help to the appropriate agencies, and, after a revitalization effort is completed, the department keeps track of further developments. "We stay on board and work with the local Georgia Power Company manager to make sure that he or she is plugged into the local leadership and knows how to get things done," says Norman.

In addition to its focus on community development, Georgia Power also works to attract new commercial and industrial customers. Programs aimed toward that goal are administered through the Industrial Development Department.

Incentive Rates

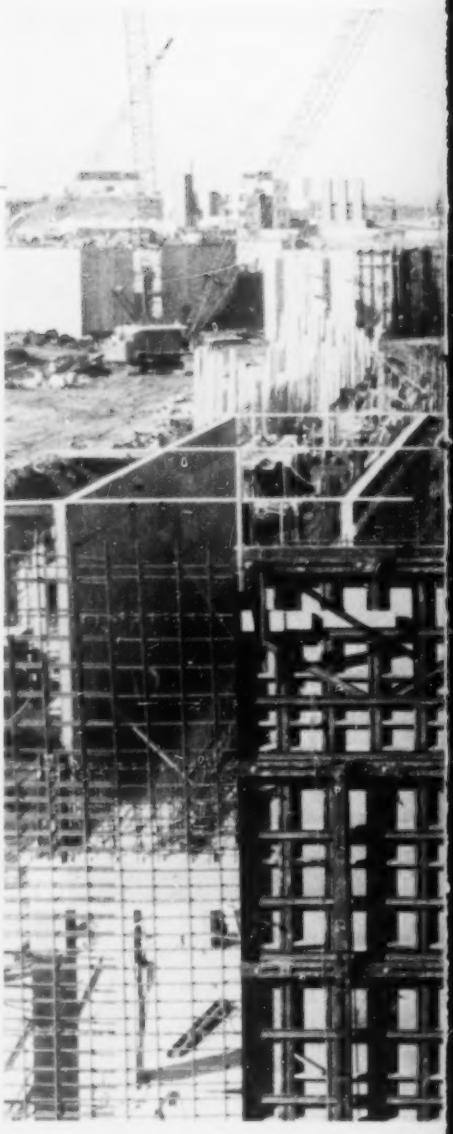
Macon, of course, is not alone in facing the problem of deteriorating neighborhoods. Many urban areas, especially in the traditionally industrial Northeast and Midwest, have seen their local economies decline since the early 1970s. The New York City metropolitan area is a prime example. To help reverse the decline there, the Consolidated Edison Company of New York, Inc., launched a program in 1981 to provide commercial and industrial customers who start, relocate or expand businesses in designated economically depressed areas with reduced electric rates.

According to the company's Manager of Area Development, John Manak, Con Ed was the first utility in the nation to offer incentive rates. "We had underutilized facilities in certain areas of our territory, and we recognized that if we could utilize that investment it would help all our ratepayers," he explains. "It would help create jobs and make the entire economy of our area healthier."

Initially, eight areas in the South Bronx and Brooklyn were certified as economically depressed by the city's Office of Economic Development. In October 1984, the program was expanded to include 18 underutilized areas in all five city boroughs. To qualify for the Con Ed special rates, electric load in the areas was no more than 50 percent of capacity, electricity use had to have declined by at least 20 percent in the last five to ten years, and each area had to be at least 90 square blocks in size to be administratively feasible for the program.

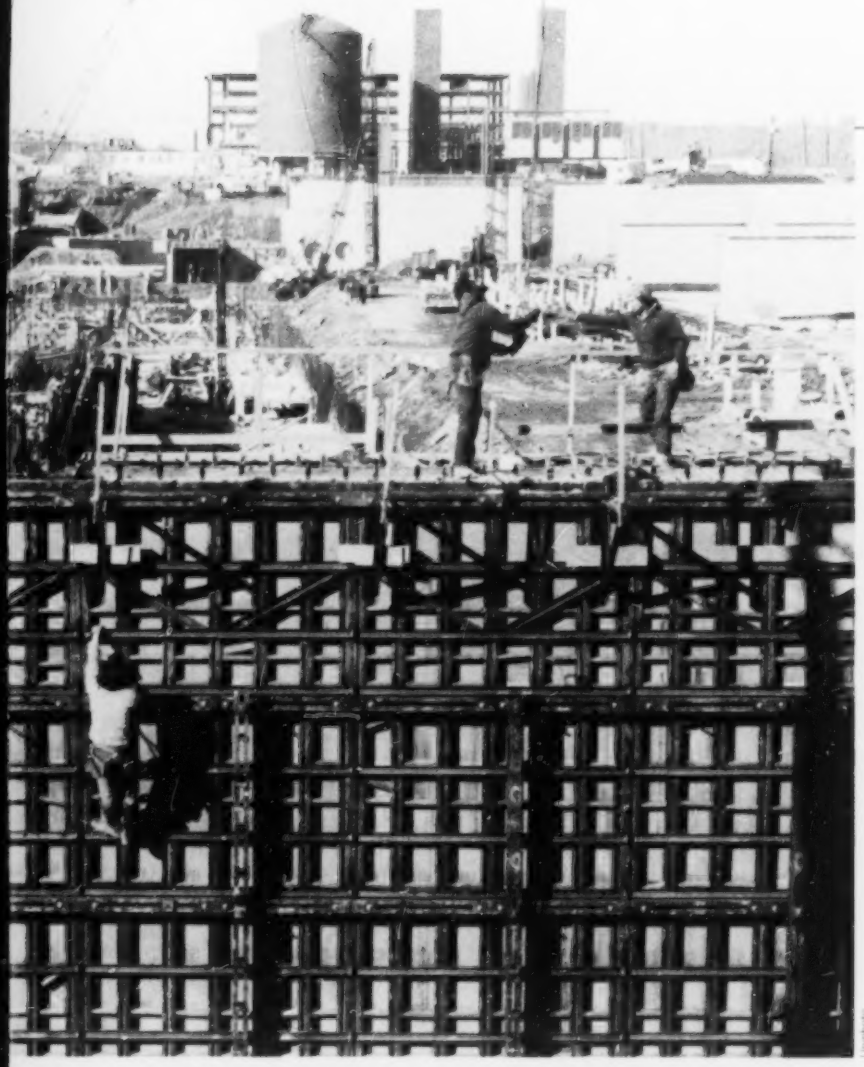
More than 3,600 customers currently receive rate reductions of up to 25 percent in electricity costs under the Area Development rate. Each customer receives maximum benefits for five years, with gradually declining benefits available for the following five years.

Con Ed credits the program with creating over 14,000 new jobs, and, to spur additional growth, the company recently began offering rate reductions to new occupants of vacant or



newly constructed buildings. Benefits range up to 12 percent off electricity bills for those who occupy vacant buildings and up to 10 percent for occupants of new buildings. These Business Incentive rates require the building owner to be receiving local real estate tax incentives for a minimum of five years under New York state law and apply throughout the Con Ed service territory with the exception of midtown and downtown Manhattan.

To publicize its program,



Con Ed's Project Appleseed has created 14,000 new jobs.

Businesses that occupy vacant South Bronx buildings get up to 12 percent off electric bills.

named Project Appleseed, Con Ed has conducted extensive advertising campaigns and has established procedures for contacting potential users. "All new commercial and industrial customers automatically receive letters explaining the program and its eligibility requirements," Manak notes, adding that the reduced rates have raised few protests from either residential customers or other commercial and industrial customers "because the rates are set so that a customer carries all the costs for his or her service and makes a small contribution to income." Thus, full-rate customers are not subsidizing the incentive rates. In fact, the incentive rates benefit everyone by attracting new customers and spreading fixed costs over a larger base.

The Detroit Edison Company's recent experience with incentive rates also testifies to their success. The largest portion of Detroit Edison's sales is to industrial customers—about 50 percent—with 20 percent to commercial customers and the remainder to residential customers. Thus, when the automobile and steel industries closed a number of installations, laying off large numbers of workers, and other large industries moved out, the utility's sales dropped precipitously.

According to James Tuttle, Assistant Vice President and Manager, Marketing, for the company, an optional interruptible rate for qualified industrial customers is bringing an additional 150 megawatts of electricity demand on line. Another incentive rate, which eliminates demand charges under certain conditions, has made it possible for steel companies to increase their operations, rehiring many laid-off workers. Noting that the utility has provided assistance to companies that will create nearly 6,800 new jobs in its service area, Tuttle believes the company's efforts have helped the city regain its economic

health and contributed to the upturn in electricity consumption in 1982.

Of course, incentive rates are just one component of the company's economic development activities. As Detroit suffered through the recessionary 1970s, The Detroit Edison Company quickly expanded its economic development activities, establishing an area development organization, adding personnel, and launching an extensive advertising campaign. Utility personnel established relationships with other economic development groups and with various state, city, and community organizations to promote development. At the same time, it began to concentrate efforts on attracting specific industries, focusing initially on petrochemicals. Since then it has expanded the list of target industries to include such fields as agribusiness and high-tech.

In addition to expanding its area development staff, Detroit Edison has hired six economic development consultants, one for each of its geographic divisions in its 7,600-square-mile service area. These consultants handle many of the economic development needs of division customers. In the future, Detroit Edison hopes to expand its efforts to place greater emphasis on providing aid to commercial customers.

Selective Growth

Utilities with relatively little excess generating capacity face special problems in promoting economic development. In capacity-constrained areas, most utilities approach economic development selectively. For example, the operating divisions of Texas Utilities Electric Company—Dallas Power & Light Company, Texas Electric Service Company, and Texas Power & Light Company—actively seek only those industries that will increase off-peak electricity consumption. The TUEC group simultaneously promotes programs to reduce peak electricity use. Pacific Gas and Electric Company is considering a

Detroit Edison's advertising campaign entices new industrial customers.

We're here to show you the sites, introduce you around and perform a little magic.
Detroit Edison
Helping one another . . .
Business to business.

Utilities with relatively little excess generating capacity face special problems . . .

program that, if adopted, would direct its efforts primarily toward retaining existing customers and shaping the load of customers with expansion plans.

Located in an area experiencing relatively rapid growth, TUEC has maintained an active economic development effort despite its relative lack of excess capacity. "The management of the company is dedicated to helping our communities, and it understands the need for economic development," explains Tom Heath, Director of Economic Development for Texas Power & Light. "If we're going to have a healthy and vibrant economy in our service area, then it behooves us to help get those jobs created."

TUEC actively seeks businesses that have high load factors as well as those that may be good cogeneration prospects. It provides them and all other prospective customers extensive information on the communities in its service area, including data on available buildings and sites, local taxes, transportation and educational facilities, wages, and other relevant information. "When industry representatives come to us with their requirements, we can look in our files and quickly tell them whether there's anything in the area that meets their needs," notes Heath.

According to EEI's Prindle, employers are attracted to a particular area increasingly by quality of life considerations in addition to considerations such as labor costs and transportation facilities. "In terms of community development, you've got to be able to show prospective employers why they should move there," he says.

To aid industrial customers further, TUEC offers them interruptible rates that are considerably below regular rates, thus encouraging increased development while providing the utility with a means to control peak load.

The program that PGandE is considering would foster growth in the off-peak period while controlling peak load. "The proposed program's goal would be to retain existing commercial and industrial customers and to work with customers expanding facilities to develop a load profile consistent with the company's load management objectives," says Don Bules, a PGandE energy services consultant.

According to Bules, forecasts indicate that the company's load factor will drop over the next ten years as peak electricity demand increases faster than average electricity demand. The proposed plan would be designed to help reverse that trend. "We would like to provide a combination of rates and incentives to alter our customers' load shape so that we're spreading the load over more hours, shifting as much of the peak load to off-peak as possible."

PGandE also is evaluating more traditional area development programs in which customers could turn to the utility for technical assistance in choosing sites and selecting technologies. Bules notes that such efforts under study would include the kinds of assistance provided by Georgia Power to its communities in meeting their development needs. "We would like our program to use the Georgia Power Company program as a model so that we have both a community development focus and an industrial development focus," says Bules. "Before they even bring a customer to a community and try to develop a partnership, they work with that community so that it can handle the increased demands placed on it."

Economic development activities vary widely across the nation, but they share one common attribute, according to Prindle: they benefit everyone. He says, "In the classic test of utility programs, regulators ask, 'What are the benefits to the people who participate, to those who don't participate, to the area as a whole, and to the company?' Economic development creates a rising tide—it lifts all those boats." EP

THE DIMMING OF AMERICA

Without regulatory reform, America may be headed for a dim tomorrow.

By Peter Navarro

Peter Navarro is a researcher at the John F. Kennedy School of Government's Energy and Environmental Policy Center and a teaching fellow at Harvard University.

This article is excerpted from Navarro's new book, *The Dimming of America: The Real Costs of Electric Utility Regulatory Failure.* It is published here with the permission of Ballinger Publishing Company. According to Navarro, political, institutional, and ideological forces are combining to suppress electric rates below the true cost of generating electricity. In response to this regulatory failure, utilities are pursuing a strategy of capital minimization that leads to higher fuel and capital costs and a less reliable electricity supply. America will ultimately pay the price for regulatory failure with higher rates, less reliability, reduced national security, and a weakened economy—unless she acts soon to reverse the current situation.

The electric utility industry is the energy cornerstone of the American economy. After a century of continual innovation and steady expansion, this industry now provides one-fourth of the power used by our homes, one-third of that used by our stores and businesses, and one-seventh of that used by our nation's factories and industries; its power plants and equipment comprise over one-fifth of the nation's invested industrial capital.

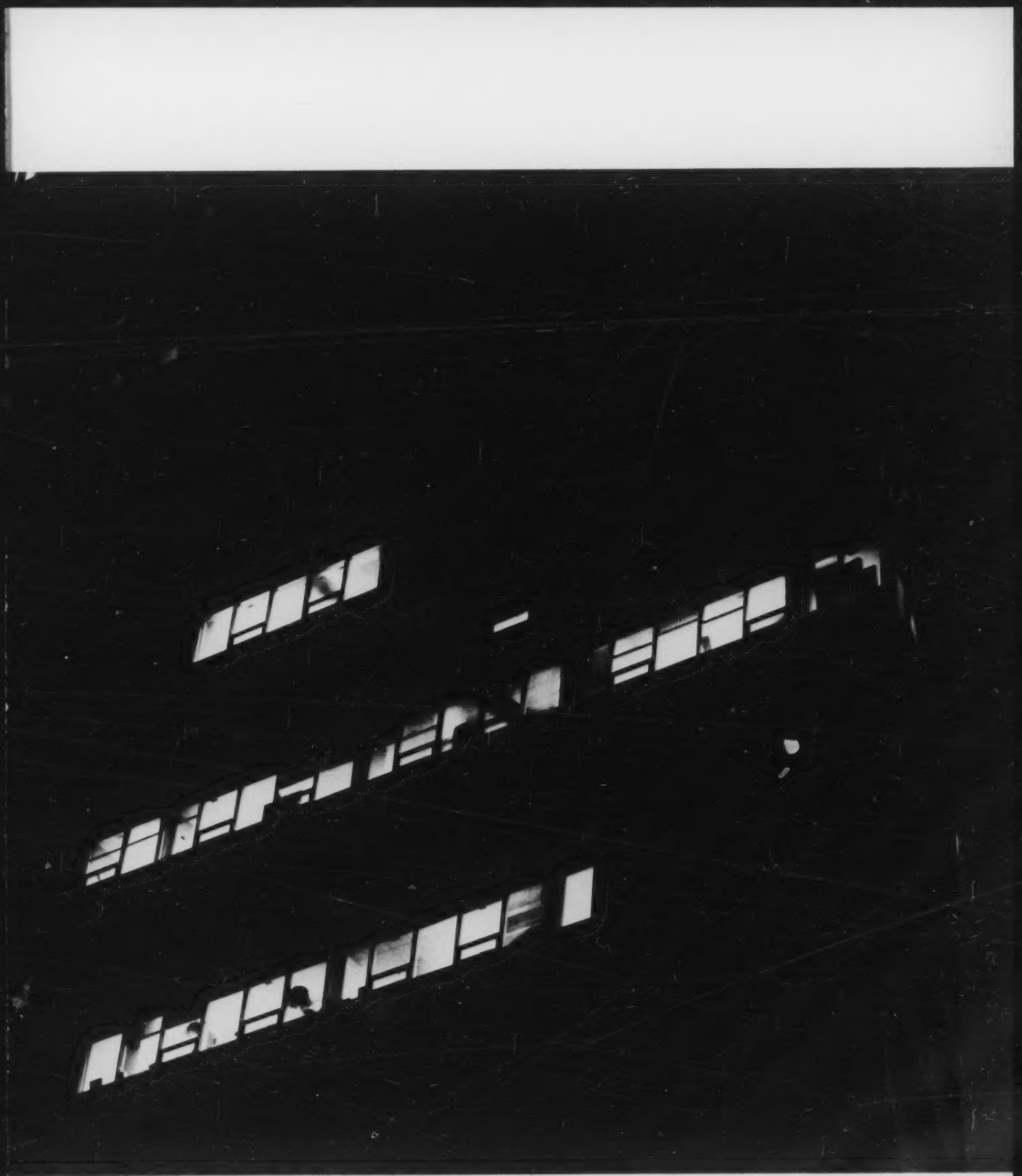
America's electricity supply is among the world's most reliable. With the flick of a switch, electricity feeds our vacuum cleaners, air conditioners, televisions, and stoves; it services our hospitals and schools; it lights our neighborhood playgrounds and streets; and it provides jobs and income for tens of millions of Americans. It is there when we need or want it, making our lives more comfortable, convenient, and in some cases, simply possible.

At the same time that it supports the nation's current high standard of living, electricity also promises to be the energy springboard for our future growth and prosperity. Already it serves as the basis for a wide variety of productivity-enhancing technological innovations and industrial devices, ranging from computers and robots to electric arc furnaces, advanced metallurgical processors, and lasers. It is revolutionizing such fields as telecommunications, transportation, agricultural irrigation, and food processing.

Unfortunately, after more than a decade of rapidly rising energy and capital costs, the electricity cornerstone is now threatened. Amidst the falling stock prices and bond ratings of a once blue-chip industry, the dimming of America—in the sense of massive electricity shortages and stoppages—has been predicted. . . . [S]uch warnings may be unduly alarmist, but . . . there is a great danger of a more figurative dimming of America. In this electricity future—which can be avoided—we may face the possibility of needlessly high electric rates, an unnecessary and increasing reliance on foreign energy, and reduced economic growth. A remote possibility also exists—in some regions of the country more than others—of periodic electricity shortages and, in the worst-case scenarios, resultant blackouts, rolling brownouts, and electricity rationing.

Driving America toward this dim future is a greatly flawed system of electric utility regulation, which, for a multitude of

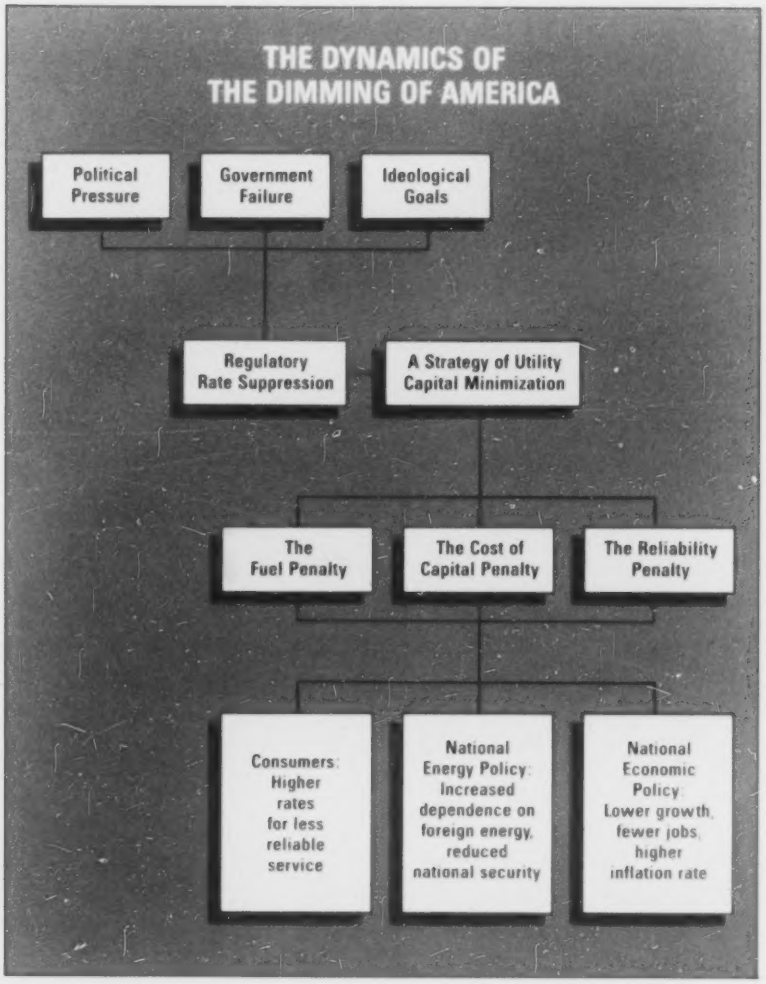
Ed Carlin



Will some of the lights go out?

largely misunderstood reasons, is unable to keep pace with abrupt and rapid changes in energy and capital costs and equally jolting changes in energy demand and use patterns. The result of this regulatory failure is "rate suppression," a pernicious phenomenon marked by electricity rates that continually rise but never fast enough to cover the true and steadily escalating costs of generating electricity. As a result of this phenomenon, and despite the fact that electricity rates have more than tripled since the early 1970s, many utilities have seen their real earnings cut almost in half.

In response to such rate suppression and the attendant erosion of utility earnings, today's electric utility executives have been increasingly turning to a "strategy of capital minimization." That is, because of new financial constraints, utility managers have been dramatically cutting back on the capital investments that are necessary to keep the lights on and rates as low as possible. These foregone investments include those that should have been made for reliability reasons (primarily new power plants to meet load growth) as well as those that are economic and so would cut consumers' electricity bills (projects ranging from coal conversion to conservation). Today, because of regulatory constraints, such investments are, from the utility executive's point of view, either financially unsound or financially impossible. . . .


THE DYNAMICS OF
THE DIMMING OF AMERICA
Political Pressure
Government Failure
Ideological Goals
Regulatory Rate Suppression
A Strategy of Utility Capital Minimization
The Fuel Penalty
The Cost of Capital Penalty
The Reliability Penalty
Consumers: Higher rates for less reliable service
National Energy Policy: Increased dependence on foreign energy, reduced national security
National Economic Policy: Lower growth, fewer jobs, higher inflation rate

The Risk of Underbuilding

Prior to the 1970s, utility executives and engineers lived in a predictable world where the demand for electricity increased at roughly 7 percent a year with little fluctuation. Utility planners could plot this steady growth by drawing a straight, upward sloping line on a graph. Meeting customer needs was a simple matter of planning new power plants to meet the next point on the demand graph.

Today, the predictability of new capacity needs has gone the way of twenty-five-cent-per-gallon gasoline, as soaring energy costs and repeated doses of recession and "stagflation" have drastically altered the formerly linear pattern of electricity demand growth. As a result of conservation and the pressures of recession, the pre-1970s average rate of growth in electricity de-

Two of our largest states—Texas and California—will definitely face severe shortages . . .

mand has been cut almost in half to the rate of 3.6 percent. Moreover, this average rate is the product of very erratic growth rates in individual years. . . . In some years, such as 1972, 1973, and 1976, electricity demand growth has been as high as 6.3 to 8.4 percent. But in recession-plagued years such as 1974 and 1980, it has been close to zero and in 1981-82 even negative.

In thinking about the reliability penalty [created by the rate-suppression/capital-minimization syndrome], one important question to consider is to what extent conservation will continue to hold down the growth rate in electricity demand. In some quarters it is argued that through conservation and a leveling off of population, zero electricity demand growth is both feasible and desirable. In such a world, new power plants would be needed only to replace whatever capacity wears out.

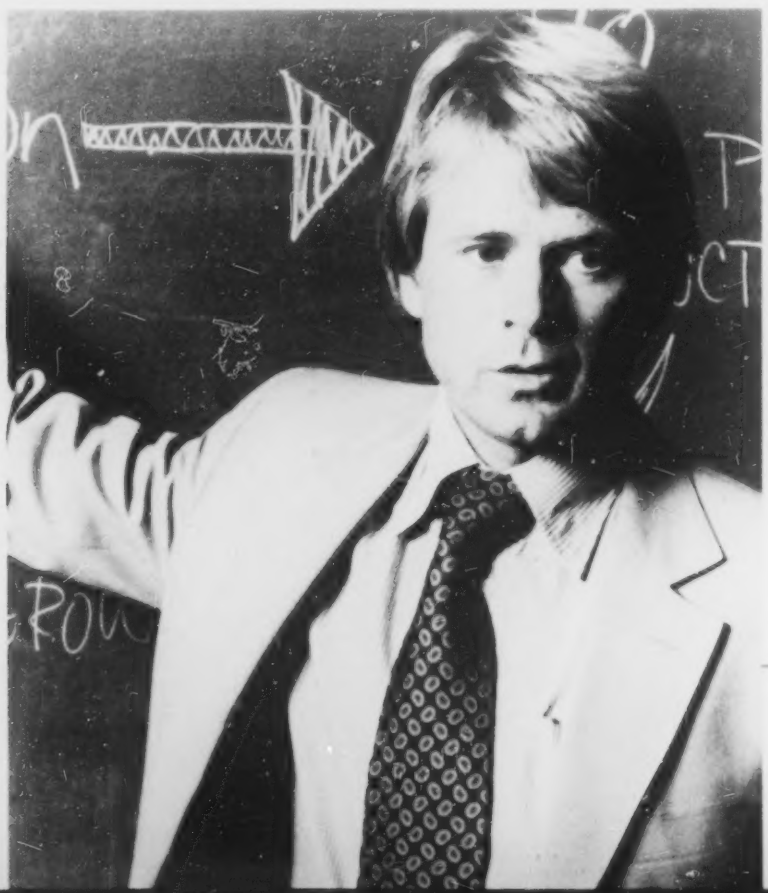
But most analysts are not so sanguine about conservation's potential to bring electricity demand growth to a complete halt. These analysts see the low growth rates in electricity demand during the 1970s and early 1980s as being attributable as much to economic recession as to conservation, and they point to the rebound of demand growth in periods of economic expansion to buttress their argument. These rebounds are marked by the higher growth rates such as the 6.3 and 4.6 rates in 1975-76 and 1976-77 and the latest case in point, the improved 3.6 percent annual growth rate observed in the later stages of Reagan's "economic recovery." (In the second half of 1983, in fact, electricity demand grew at a rate of about 8.5 percent over that experienced in the second half of 1982.)

Moreover, many analysts believe that the "quantum leap" gains from conservation have already been made so that its ability to drive demand growth down further is weakening. . . .

Accordingly, most analysts predict that demand for electricity will continue to grow at a rate of at least 3 percent per year and, if the economy continues to recover over the next few years, perhaps even higher. Among those making such predictions are the Department of Energy and the Electric Power Research Institute. Data Resources, Inc. makes a slightly more conservative estimate; it forecasts a 2.67 percent growth in demand through the year 2000.

Within the context of the rate-suppression/capital-minimization syndrome, these predictions are foreboding. For even with the demand growth of an earlier era cut by more than half, the required investment in new power plant construction to meet our future electricity needs is staggering.

At present, the value of utility assets exceeds $280 billion. But just to meet the requirements of a 3 percent annual growth rate, by the year 2000 the utility industry will have to build over 400 gigawatts of capacity, which is a hefty addition to its current capacity of roughly 650 gigawatts. To accomplish this expansion, it will have to invest a cumulative total of approximately $1 trillion (in constant 1982 dol-



Peter Navarro

New construction is lagging dangerously.

lars). That figure dwarfs the industry's existing asset base, which was $300 billion in 1981. Moreover, to meet future demand, the utility industry will have to begin to undertake such investments now. It takes a minimum of six to eight years to build a new power plant, and these lead times can, for a variety of financial and regulatory reasons, stretch to between ten and fourteen years.

Is there any evidence to suggest that the utility industry is moving forward to meet forecast demand? There is considerable evidence on the industry's prospects for supplying electricity, but it points to the unfortunate conclusion that some regions of the United States will be woefully short of new capacity to keep the lights on if the utility industry continues its unprecedented trend toward the cancellation, delay, and deferral of new construction. . . . [O]ver half of the new coal and nuclear plant capacity scheduled through 1988 has been delayed an average of 20 months, and from 1977 to 1982, about 140 generating units representing some 150,000 megawatts of electricity were canceled or deferred indefinitely. Further, no new nuclear units have been ordered since 1978, no new order for a major generating project was placed in 1982, and only one order was placed in 1983.

According to the Department of Energy, this pattern of cancellations, delays, and deferrals will almost certainly lead to serious supply shortages in some states and regions of the country by the early 1990s. For example, if electricity demand grows at only 2 percent a year, utilities in Kansas, Arkansas, Louisiana, the Dakotas, Minnesota, Iowa, Nebraska, and parts of Missouri and Mississippi will face a serious shrinkage of the reserve capacity (or "reserve margin") they have as insurance against power failures, a shrinkage which could lead to serious shortages, blackouts, and brownouts. Two of our largest states—Texas and California—will definitely face severe shortages in the 1990s if the trend of capital minimization continues.

Reliability versus Economic Reserve Margins

The seriousness of this situation in some regions of the country is masked by the fact that when the capacity situation is assessed from a national perspective, there seems to be a surplus of power plants. To avoid succumbing to the illusion of excess capacity and to fully understand the reliability penalty, it is useful to know how reliability is measured.

The most frequently used measure is a utility's *reserve margin*, which measures the amount of extra capacity that a utility has standing idle but that can be called into service should some plant or plants in the system fail. It is the percentage of capacity a utility has over and above its peak, or maximum, demand.

The traditional guideline is that a 20 percent reserve margin is sufficient to maintain system reliability. Margins above that rule-of-thumb level are supposed to signal "goldplating"—a utility's efforts to cram excess capacity into its rate base in order to boost its profits. But reserve margin calculations can be and have been interpreted erroneously.

For example, projections of the national average reserve

It is no longer correct to think of the 20 percent rule as etched in stone.

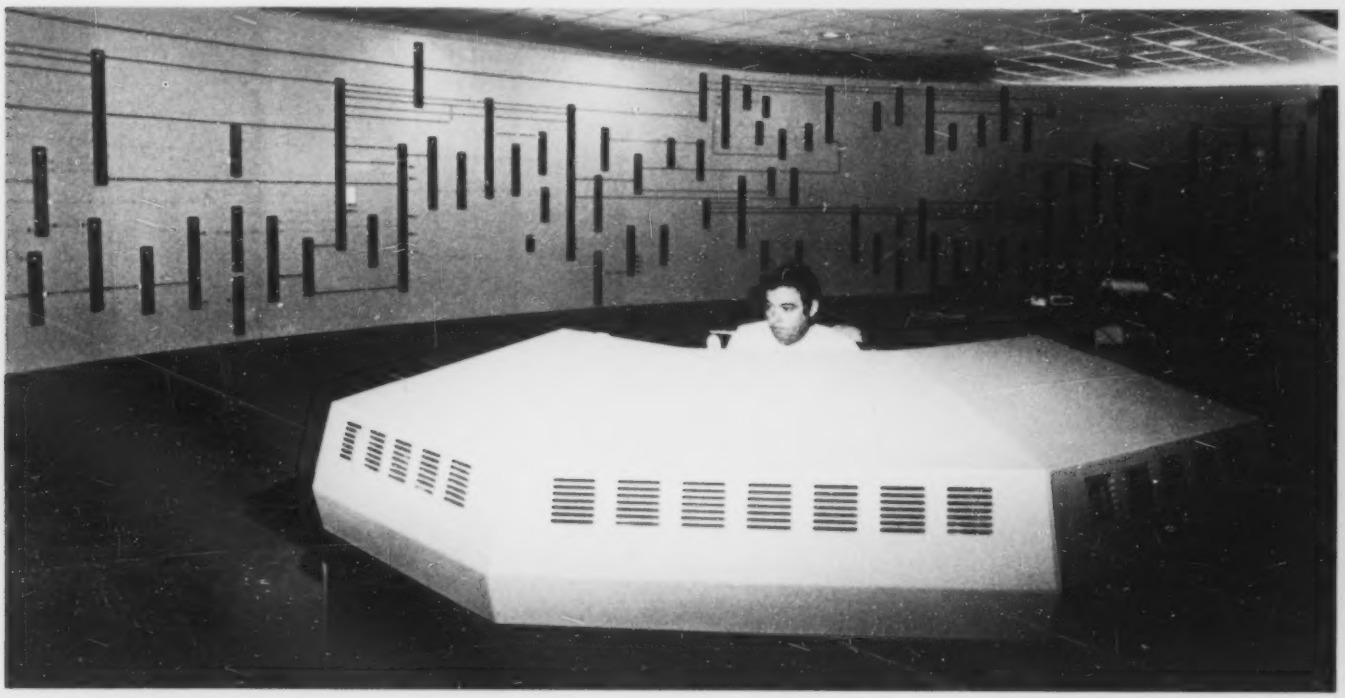
margin for 1990 are above 20 percent (assuming that the demand growth rate is 3 percent or less). These figures provide no hint of a problem. But they are deceptive, because the "national average" is a combination of both the seemingly high reserve margins in some of the more petroleum-dependent regions as well as the margins for those regions where an underlying reliability problem exists. When the high margins of such areas as New England and the Tennessee Valley are averaged in with lower margins elsewhere, the national average comes out at an apparently comfortable 33 percent.

This figure ignores the reality that the "national" electricity grid that transmits power is not national at all. Rather, it is a loosely and incompletely connected *regional* grid system that lacks the lines and interconnections for adequately linking the supply-rich regions with the supply-poor ones.

For example, the transmission lines connecting the northwestern United States to California, which is a major potential victim of capacity shortfalls, have limited capacity, although they are likely to be expanded from 1,600 megawatts to 3,100 megawatts. Worse off is Texas, which for longstanding political reasons has a completely independent grid that renders it almost totally incapable of receiving power from other states.

Nor is the solution simply to build enough transmission lines to connect the have and have-not regions. Most of the extra capacity in the United States will, by the 1990s, be expensive oil- and gas-fired power plants. This is a subtle but extremely important point: while such power might be useful in a crisis (and probably will be used in a crisis, further raising the fuel penalty imposed on consumers), building transmission lines—which themselves require considerable investment—would be far more expensive than building new nonpetroleum capacity in the regions where shortages are anticipated.

The combustion-turbine strategy is not an economic alternative to electricity in short supply either. Under such a strategy, utilities would build oil- and gas-



Because the electricity grid is regional, power cannot always be dispatched from areas with surplus to areas with shortages.

fired turbines to fill the breach. Since these turbines are far less capital-intensive than, say, a coal plant, they can be up and running within a year or two. The obvious drawback of "CTs" is that because they are petroleum dependent, they produce electricity at a cost two to three times that of a coal plant. Would the industry install such petroleum guzzlers to keep the lights on? Most likely, since such a strategy was adopted in a similar period of crisis in the late 1960s and early 1970s when the industry purchased and installed some 35 gigawatts (the equivalent of 30 large coal plants) to ensure reliable service. While these combustion turbines saved on the reliability penalty, the burden of the shortage was merely shifted to the fuel penalty—and consumer bills. It would be unfortunate to repeat this mistake.

The reserve-margin rule is frequently invoked by opponents of new power plant construction who argue that conservation has made such construction unnecessary. But this concept, if adhered to, will have severe consequences for both ratepayers and the nation.

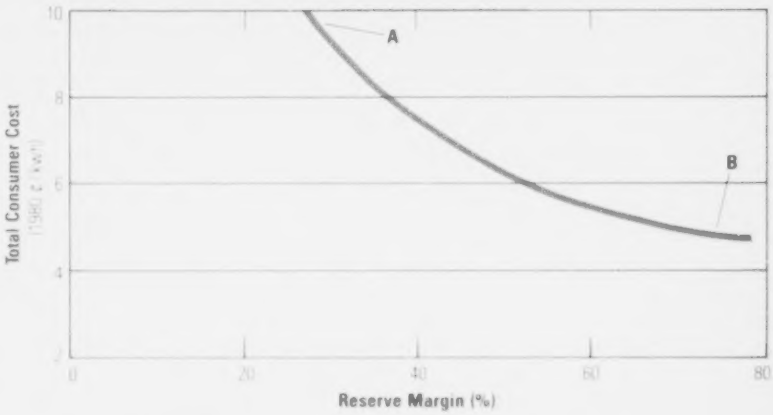
At one hearing before the Connecticut Public Utility Commission, the state's public counsel and PUC staff strongly opposed Northeast Utilities' request for a rate hike that would have facilitated the completion of Millstone 3, a large nuclear plant. The PUC's argument against the increase was that the addition of Millstone would have boosted Northeast's reserve margin to over 40 percent, excessive in its view. But according to testimony delivered by the U.S. Department of Energy in the hearing, the actual excess capacity would be noneconomic oil capacity, and the resultant savings of having the nuclear unit displace the oil capacity would actually reduce electricity rates below what they otherwise would be.

The crucial point this example illustrates is that the post-embargo economics of petroleum displacement require a more modern view of reserve margins. It is no longer correct to think of the 20 percent rule as etched in stone. Instead, it should be regarded as merely a lower bound, below which no utility would want to fall for reliability reasons but above which utilities may want to go for economic reasons. Thus, a utility heavily dependent on petroleum can in some cases build a new nonpetroleum power plant and double its reserve margin but still save ratepayers money; the petroleum plants would be put on standby, used sparingly (if at all), and gradually retired.

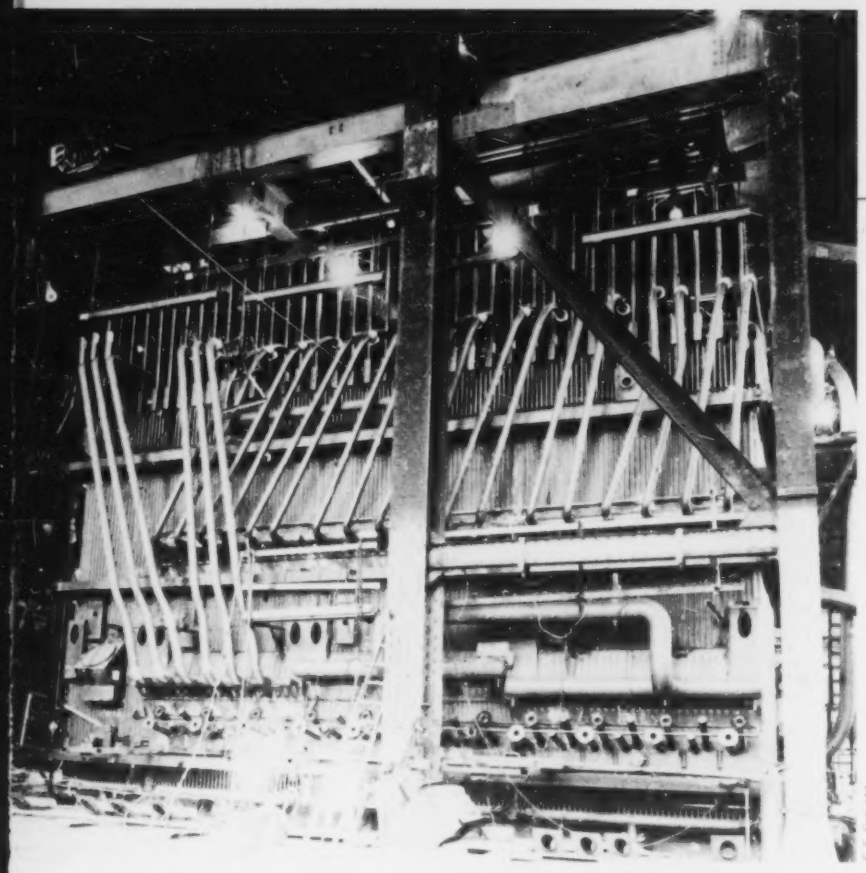
The Department of Energy's *National Electric Reliability Study* has brought this important distinction between "reliability" and "economic" reserve margins into sharp focus. The study analyzed a number of regions in the country to determine their economic reserve margins—that is, those margins that provided the lowest cost electricity generation. It found *no* relationship between the 20 percent reliability rule of thumb and the economic reserve margin. Instead, DOE found that economic reserve margins appear to be highly variable and largely dependent on the amount of petroleum in a utility's or a region's generation mix. The new rule of thumb

Figure 1

Economic versus Reliability-Reserve Margins: New England.



Source: The National Electric Reliability Study, Vol. 1, February 1980



New technologies such as atmospheric fluidized bed combustion can help ensure reliable power.

is that the economic reserve margin rises with the amount of petroleum in the generation mix.

Figure 1 illustrates the principle of economic reserve margins for New England, a region that depends on oil for more than 60 percent of its electricity generation. The vertical axis measures the cost to consumers per kilowatt hour, and the horizontal axis measures reserve margins. As new coal and nuclear capacity is added to displace existing oil plants, the region exceeds the 20 percent reliability reserve mark, yet electricity costs steadily decline. At a 27 percent reserve margin, the cost of electricity is 9.9 cents per kilowatt hour (see point A on the graph). This is the margin New England is scheduled to maintain through the next decade. If New England were to instead pursue the economics of petroleum displacement and build to a 78 percent reserve margin (point B), it could cut the cost of electricity by more than half, to 4.6 cents per kilowatt hour. Similarly, DOE found that for petroleum-dependent utilities in the southern California/southern Nevada region, the economic reserve margin was 70 percent, while in the Florida-Southern Company region, the lowest electricity costs were achieved at a reserve margin of 49 percent.

Thus, load growth is not the only reason to build new power plants. And reserve capacity above the percentage traditionally prescribed for reliability reasons is not necessarily extravagant. On the contrary, even very high reserve margins can be uneconomic. This fact lends justification for adding new capacity to displace petroleum.

Unfortunately, many regulators are reluctant to accept an economic determination of desirable reserve margins. State commissions typically allow in a utility's rate base only those assets that are "used and useful." If a utility builds a new nonpetroleum plant to substitute for an existing, economically obsolete petroleum plant, it faces a major risk: if the commission adheres to the traditional reliability view of reserve margins, it may deem the plant unnecessary from a reliability standpoint and not allow it into the rate base. Indeed, a 1980 decision by the Missouri Public Service Commission not to allow an *operating* coal plant into Kansas City Power & Light's rate base is evidence of the seriousness of this risk. The specter of being denied a return on new, petroleum-displacing capacity provides utility managers with yet another disincentive to undertake capacity expansion to eliminate petroleum economically.

Partially as a result of utilities' attempts to adopt this new concept of economic reserve margins, some petroleum-dependent regions of the country now have reserve margins well in excess of 20 percent. For example, in New York the reserve margin is about 40 percent, while in the Dakotas, Minnesota, Iowa, and Nebraska it is 44 percent. On the other hand, current reserve margins in California are not only below what is economic but also below the old 20 percent reliability rule. . . .

Between Complacency and Crying Wolf

In considering the reliability penalty, one final comment is perhaps in order. America has never faced a serious electricity shortage. This is true despite occasional dire warnings by the electric utility industry that such shortages are just over the horizon. Unfortunately, the absence of serious shortages makes most of us oblivious to the dangers, just as most of us were unaware of the possibility of an oil embargo before 1973. Our resultant complacency is compounded by the industry's propensity to "cry wolf." But to paraphrase James Akins's comment on the Arab oil embargo, the rate-suppression/capital-minimization syndrome suggests that soon the wolf may really be here. [*Foreign Affairs* (April 1973): 462.] At least in some regions of the country, current forecasts point to exactly that conclusion.

The seriousness of such a conclusion behooves us to carefully assess the probability that the lights of America will actually flicker and dim. Given the recent proliferation of "quick and dirty" fixes such as expensive petroleum-fired combustion turbines and reserve petroleum capacity, we must also ask whether the lights going out is the real worry. Perhaps the dimming of America will occur in a more figurative sense, through an economically dark and drab future of soaring electricity rates, falling real incomes, fewer job opportunities, and slower growth.

Without an infallible crystal ball, the only way to predict what the future holds for us is to ask ourselves what must happen for electricity shortages first to occur and then to persist.

The first requirement is a continued growth in electricity demand in those regions most susceptible to supply shortages. Since the greatest levels of both economic and electricity de-

Regulatory failure will ultimately reduce America's standard of living.

This "seige mentality" is . . . a product of the pressures that the industry has been under for the last decade.

mand growth are forecast for precisely those states and regions where average reliability reserve margins are lowest, it is reasonable to conclude that this requirement will be met.

The second requirement is that utility executives in the most vulnerable regions must continue to pursue a strategy of capital minimization. That is, they must build no new plants (or fewer plants than necessary) to meet forecast demand. While again a crystal ball would be useful, the limited evidence we do have suggests that this requirement may be met as well, for in those vulnerable regions as in the rest of the country, new plants are also being cancelled, delayed, and deferred.

The third requirement is that utility executives must fail to react in time to prevent impending electricity shortages. From an economic viewpoint, that means in many cases failure to build new nonpetroleum plants such as coal capacity now and throughout the 1980s and 1990s. These plants would take anywhere from five to twelve years to complete and would be ready to meet growing demand in several decades to come.

From the standpoint of pure reliability, however, this reaction can also mean failure to build noneconomic combustion turbines even a few years before the actual shortages hit. Although electricity from these "CTs" would cost considerably more than new nonpetroleum plants (on the order of double to triple), they could in fact prevent the literal dimming of America.

It is likely that CTs will be built—but probably not until shortages actually hit. For one thing, federal law prohibits the construction of new petroleum capacity except in an emergency. Prospective or anticipated shortages alone are not enough to allow a waiver. Moreover, building CTs, despite their low capital requirements, is inconsistent with a strategy of capital minimization, so utility executives are likely to postpone making the investment until the last minute. They might even wait until their PUCs order them to build the CTs, because otherwise they run the risk that the PUCs won't allow the considerable fuel costs to be passed through to consumers.

Finally, utility executives have said on more than one occasion (although never publicly) that they are tired of environmentalists, anti-nuclear protestors, and consumer advocates telling them not to build new plants. Utility executives resent the implied usurpation of their prerogatives as managers and industry experts. In the same breath, they say that only a crisis such as a major electricity shortage will wake America up to the severe regulatory problems that exist. This "siege mentality" is, of course, a product of the pressures that the industry has been under for the last decade. It is as unconstructive as are the often bold accusations of the industry's critics. The bottom line of this seeming tug-of-war is a set of utility executives increasingly unwilling to make decisions that protect the public from a dark future but that are likely to draw the public's wrath.

Thus, shortages will occur in some regions, and these shortages will endure for one to two years—a short time in the scheme of things perhaps, but a fairly long time from the standpoint of politics. The literal dimming of America is therefore likely to be a relatively brief affair. Nonetheless, we should beware of the combustion turbine solution to the reliability problem, for . . . it will only hasten the economic dimming of America.

Unphoto

HOW TO "GIVE AT THE OFFICE" WITHOUT WRITING A CHECK

Non-profit community-based organizations need more than money, and electric utilities can help.

By Clifford L. Alexander, Jr.

Clifford Alexander, former Secretary of the United States Army, is President of Alexander & Associates, Inc., a Washington, D.C.-based corporate consulting firm.

Non-profit community-based organizations are having the financial rug pulled out from under them. In addition to the same increases in expenses that have beset the rest of the business world, non-profits also are weathering recent and proposed cutbacks from governmental funding sources. Consequently, many of these organizations are targeting non-governmental sources for help.

The electric utility industry can take advantage of this opportunity to help. The goodwill generated by active involvement with community-based organizations is more than its own reward—in the long run, it is essential to the industry's success.

Aiding these beleaguered institutions will take leadership, imagination, personal skill, dedication, and—surprisingly—much *less* money than one might expect.

Non-profit community-based organizations have realized that even though money is *always* useful, it is only one approach to giving and necessarily the most passive approach. The private corporations and foundations that they have asked for contributions have, in turn, begun to ask them what they are doing to help themselves. As a result, non-profits are beginning to review ways in which they might "earn" money. They now seek new and more imaginative, practical, and integrated approaches to sharing the corporate largesse.

With these ideas in mind, Alexander & Associates, Inc., recently evaluated prevailing needs of certain non-profit organizations. Through telephone interviews with selected community-based groups, we identified their most pressing concerns and needs, asking, "What is the most valuable assistance other than direct monetary contributions that you could use right now from a corporation or business?" The cross-section of organizations surveyed was taken from the fields of education, social welfare, and health/medicine.

The results of the survey, taken together with other research and data, indicate that non-profits can and want to benefit in a variety of ways from corporate generosity. While a "need" was clearly established by all the organizations contacted, money was not the only source of help they suggested, even though many of them were experiencing financial difficulties due to budget cuts. Surprisingly enough, only one group said that money was its "first and foremost" need.

The largest number of responses to the survey came from educational organizations. Most of their executive directors were reached and replied to our questions during our initial phone contact. The majority of requests were for assistance in general management and business/office procedures and techniques. Heads of social welfare organizations were more difficult to reach, but once contacted, they were eager to engage in lengthy discussions about their needs and how the private sector could help them. More than anything else, these individuals cited a need for

The Detroit Edison Company

Detroit Edison employees donate supplies to a local shelter for battered women and abused children.

The Cleveland Electric Illuminating Company: Lending Computer Expertise

John Stolarski put the Taylor Center on-line.

The Cleveland Electric Illuminating Company's John Stolarski knew very little about managing the files of the Murtis H. Taylor Service Center two years ago, but he knew practically everything about organizing the utility's records.

Using his experience as a computer expert responsible for 700,000 monthly bills, Stolarski helped the Center, a halfway house for mental patients, to put its patient and accounting records "on-line."

The United Way's loaned executive program brought the Center staff together with the knowledgeable computer pro. "The Center wanted to go from manual record-keeping to computers and we had the expertise. My task was to assist in the conversion," said Stolarski. So every Wednesday afternoon for six months he volunteered nearly three hours to the Taylor project.

"John was a very important help to us because he had the expertise we did not have," commented Riaz Ahmad, director of research and evaluation at the Center.

During their weekly conference, Ahmad and his co-workers discussed their computer problems with Stolarski and listened carefully to his advice.

"We sat and talked and looked at potential solutions. They made the decisions. It was a good approach," Stolarski said.

The Center, which is funded by state and private sources, is located in "a poverty area on the south side of Cleveland and provides outpatient services for a region of Ohio," Ahmad said.

Stolarski was not the first CEI executive loaned to public service agencies hungry for management skills and expertise. "We loaned a specialist in communication, and our chief executive recently headed a long-range planning task force for United Way," said company spokesman Stephen G. Lorton.

equipment and supplies and for assistance in managing their large number of volunteers to optimize the success of their programs. The directors of health/medical organizations were the most difficult to contact. Those we were able to reach emphasized their need for office personnel and equipment, and all noted the need to increase the efficiency of their fundraising efforts to maintain the vitality of their research programs.

Among the groups contacted, the largest need was for management training and development. Budget cutbacks and shrinking funding sources have forced these operations to look at ways to improve their internal organizational systems to maximize the "profitability" of their programs. To this end, executive directors overwhelmingly voiced the need for in-service training for everyone from volunteers to boards of directors and their committees. Such training would enhance the utilization of their employees and make them more effective in their present positions.

For example, these groups are interested in maintaining and improving employee morale, just like for-profit enterprises. High morale translates into more productivity and less turnover, which in turn allows organizations to concentrate on their goals and objectives. Consequently, their managers need and want training in employee motivation and appraisal, time management, and staff interaction. Many also expressed a particular need for knowledge

Clifford L. Alexander, Jr.

Alexander & Associates, Inc.

about techniques used in developing and managing volunteer staffs, since these play a special role in the non-profit sector.

Included in this arena are community hospitals and health clinics, which typically offer an abundance of both medical and non-medical services. In many ways such organizations often act as a community base, employing scores of paid and volunteer workers and acting as a liaison in community outreach programs. With continual budget cuts, however, many of their programs and services are being reduced or eliminated, and often employee training programs are among the first to go. Corporate-sponsored writing classes for ancillary personnel, for example, could give employees new skills to help them do their jobs more effectively.

Non-profits are also examining ways to generate their own revenue, and the need for information and assistance in fundraising techniques was mentioned consistently by those interviewed. Non-profits need to know how to solicit technical assistance and funds from corporations, and they need to know how corporations "feel" about such solicitations. As one director put it, "We need the advice of knowledgeable people who can give us leads on where to get money." In addition, a few directors suggested that corporations may want to provide income-generating alternatives and venture capital toward self-sustainment for not-for-profit organizations.

A large number of those contacted also expressed a need for training in financial management. In particular demand is information on financial systems and planning and on the "nuts and bolts" of fiscal management, such as budgeting, bookkeeping, and accounting. Among the specifics mentioned were help in organizing a financial plan to buy property and build a permanent office and advice on budget management to optimize the use of donated monies.

Consulting assistance in computerizing their operations was another need identified by many organizations. While most stressed the need for professional advice to help them select the best system for their unique needs, they also indicated the need for actual hardware—including word-processing equipment and microcomputers—as well as appropriate software.

Similarly, the need for office equipment was mentioned frequently, including audio-visual equipment, furniture, office supplies, vans, heaters, refrigerating units, typewriters, duplicating equipment, video cassette recorders, and telephones. "We need all types of office ma-

Vern Chamberlain, UP&L retiree, helps kids learn woodworking skills.

Utah Power & Light Company

Leo Poulson, retired from UP&L, tutors third graders.

chines," noted one director, hastening to add, "but we don't want company 'throw-aways'—it costs too much to repair them."

Finally, it is important to note that a large percentage of the organizations surveyed expressed a need for assistance in keeping publication costs down. All of them publish at least one of the following: newsletters, magazines, pamphlets, bulletins, journals, handbooks, proceedings, flyers or books. Most also publish convention or meeting materials. Moreover, much of their fundraising is done through direct mail. The costs associated with these necessary publications can be quite significant. According to one respondent, "Publishing is our main expense, and help in any aspect of it would be invaluable." Such help could range from advising non-profits about how to solicit bids from typesetters and printers to actually providing those services with corporate resources.

The benefits of corporate goodwill are legion. Altruism aside, it is simply a matter of enlightened self-interest for a utility to be involved with community-based groups. Through such an alliance many mutual goals can be met. Non-profits could receive corporate expertise through the donation of assistance, consultation, and planning. Unlike money, information is a commodity that is not diminished when shared —instead, it provides many dividends to the donor. Such donations would not tax the budget of the utilities involved yet would prove useful as a key to the long-term self-sufficiency of any not-for-profit organization concerned. The obvious result of these services would be fewer fiscal demands made upon the company in the future.

Also, for the utility, the usual benefits of corporate image enhancement are augmented by other equally worthwhile advantages. First, non-profits generally thank a corporation publicly. This unique form of corporate public relations is highly valued because it forges a much stronger link between corporation and community. Any help given by utilities will serve to enrich the lives of their customers and make utilities' work seem more important as a part of each person's day-to-day life.

Second, corporate outreach programs are an excellent way

Non-profits generally thank a corporation publicly.

of encouraging employees to feel more involved with their company. Through such programs not only is the utility publicly praised, but by implication so are the individual employees. The result is that the employees feel good about their skills, their work, and, perhaps even more importantly, themselves. These feelings can easily translate into tangible results on the job. Furthermore, because they have taken an active part in their community *through* their workplace, utility employees may realize more fully that their company cares beyond corporate dollars and cents. The programs can embrace retirees as well.

Third, where employees of a company and their families represent a significant part of a local population, the work donated to non-profits becomes doubly important, for the sense of community is reinforced. Employee input in program development can even more readily target the specific needs of the

Portland General Electric: Sponsoring Health Seminars

Geriatric specialist Arlene Whyte said Portland General Electric Company's seminar on hypothermia enabled her to prevent four deaths.

"There were four people in my area who I spotted because of the program I attended and it saved their lives," said Whyte, a counselor at a mental health center which treats 200 elderly people a month.

One of the symptoms of hypothermia, a condition in which the body becomes abnormally cold, is dementia, she said. As the body ages, it generates less heat internally, so older people are easily affected.

The four hypothermia sufferers were brought in to Whyte's clinic because they seemed to be crazy. "One woman came in unable to dress herself. She could not answer questions such as 'what is the day of the week?'" Whyte said.

Fortunately, Whyte knew about the effects of hypothermia because of the utility's seminar. "I asked for an internal temperature to be taken and found she was hypothermic. After three weeks of care she went home much better," Whyte said.

Before the seminar, "I knew very little about hypothermia. It was an excellent, excellent program. I took it with other health care professionals, and I think sponsoring it was above and beyond the call of duty for Portland General Electric," she said.

Locally, little was known about accidental hypothermia at the time the utility decided to sponsor this seminar, according to Nancy Byrkit, spokeswoman for the company.

"We used a program developed by the National Center for Accidental Hypothermia. Their director, Joyce Harmon, came out to give the presentation. We also got one of our local doctors recognized for his experience with hypothermia due to outdoor exposure to provide some background and relate his concern," Byrkit said. "The focus was on care providers such as nursing homes, adult foster care centers, and home care services. The idea was to make professionals aware of symptoms and how to respond."

"The elderly usually don't move as quickly as when they were younger, and their circulation may not be as efficient. So we have continued to provide hypothermia information to those who request it since that first large presentation. Another part of our concern is putting the information into a less technical program for older audiences in general. This includes, among other things, counseling them to wear more clothing in layers and to sleep with a cap on. We've had an opportunity to share some basic but little known information with many of our customers as well as those who provide services for them."

During the last three years, the program has been given for about 2,000 people. The inspiration for it came from the utility's senior citizen representatives.

UP&L retiree LaPreal Crystal supervises a classroom session.

Utah Power & Light Company

Utah Power and Light Company: Tutoring School Children

Sterling Hixson has two important skills: he is good at math and he knows how to reach out to neglected and lonely students who do not want to learn.

Hixson, 72, one of Utah Power and Light Company's senior volunteers, has spent many hours since his retirement in 1978 coaching junior high school students in math.

"If there is a student who is slow, I sit down with him at a desk and help him see through it," said Hixson.

Hixson has "lots of math tricks" which he picked up in his 40-year career as an electrical engineer with the Utah utility.

At retirement, Hixson was working as Utah Power's chief dispatcher, directing the flow of electricity from the company's power plants through its high-tension lines.

Hixson "is a wonderful volunteer," according to Margaret Hunt, coordinator of the utility's public education office.

"The schools tell us their needs and we use Utah P&L retirees. We find those willing to help students and place them with a school," she said.

"We have retirees in four schools. I keep in touch with them, helping with any problems and getting those little success stories," Hunt continued.

Hixson's success began with his assignment to Glendale Intermediate School, which is located on the poorer side of Salt Lake City. The student population is widely mixed, ranging from Samoans to Mexicans.

On and off for the last seven years Hixson has patiently helped students learn math and a little about growing up.

"There was one girl whose mother died. She wouldn't work and the teacher looked to me for help. I went to the girl and asked her, 'What's the matter?' She explained about the death.

"I said, 'Young lady, you're not the only one in the world who is unhappy. I lost my mother when I was five. You're 13 and have a much better start on life,'" Hixson said. "I worked with her and got her going."

Another student neglected his math even though he said his greatest hope was to become an airline pilot. "I told him he could not even set foot in a cockpit unless he mastered math."

Hixson applauded the program which has brought him such satisfaction. "Utah P&L has done a tremendous job here. They've got lots of employees involved."

community-based organization. A fourth plus is the fact that such public relations can also play a major role in recruitment. A company's reputation is an important factor in attracting a high caliber employee. Utilities with solid reputations in community affairs are far more likely to attract "the best and the brightest" people into the industry.

It is probably safe to assume that every community-based organization in the United States will be concerned to some degree with future funding. For this reason, the corporate outreach programs of the electric utility industry become crucial to their survival. Through the industry's assistance, non-profit organizations can be a force in creating a strong and united community by helping others and, in turn, by helping themselves.

REVIEWS

REGULATORY REVIEW

Table 1
1984 Quarterly Electric Rate Actions

	Increases Filed During Period		Total Increases Pending at End of Period		Increases Approved During Period	
Time Period	Number	Amt ($000)	Number	Amt ($000)	Number	Amt ($000)
First Quarter	28	2,446,148	132	9,966,204	59	1,337,324
Second Quarter	36r	2,513,002r	127r	9,450,073r	49r	1,137,321r
Third Quarter	33r	1,337,876r	114r	8,047,881r	36	1,138,315
Fourth Quarter	22	1,215,409	101	7,875,433	42	1,132,076
Twelve Months Ended 12/31/84	119	7,512,435			186	4,745,036

r = revised from previously reported data

1984 RATE ACTIONS SLOW

Investor-owned electric utilities were granted $4.7 billion in rate increases in 1984, the lowest amount since 1979. Requests filed during the year totalled $7.5 billion, down from the record-breaking $12.8 billion filed in 1983 and the first drop in eight years. (See Table 1.)

The lower dollar volume of filings was due primarily to the lower number of filings. In 1984, 119 requests for rate increases were filed, down from 186 in 1983 and the lowest number of filings since 1972.

Several factors worked to lessen many utilities' need to seek rate relief—declines in projected construction expenditures, recent completions and cancellations of major construction projects, lower interest rates, and the containment of operation and maintenance costs.

At the close of 1984, 101 requests for rate increases totalling $7.9 billion remained pending. By comparison, 1983 closed with 147 requests pending which totalled $9.7 billion, a record amount. The last year in which the volume of cases pending at year end was lower—$2.9 billion—was 1979; the last year in which the number of cases pending was fewer—99—was 1972.

Returns on common equity allowed by state commissions during 1984 averaged an estimated 15.2 percent, down slightly from 15.4 percent in 1983. Based on preliminary information, the composite return on equity earned by the industry in 1984 was 14.5 percent.

The return on average common equity allowed during the fourth quarter of 1984 averaged 15.5 percent. Utilities filing applications for rate increases during the quarter requested an average return on common equity of 16.2 percent. Regulatory lag during the quarter averaged an estimated 7.9 months.

Contributed by the Rate Regulation Department and the Finance Department of Edison Electric Institute.

REVIEWS

FINANCIAL REVIEW

1984 ELECTRIC OPERATING REVENUES UP 9.2 PERCENT; INDUSTRY EQUITY RATIO REACHES 41.2 PERCENT

Earnings per share of the investor-owned electric utility industry increased 5.7 percent during 1984, reaching $3.13, up from $2.96 in 1983. The 17 cents net per share growth in earnings resulted primarily from increases in income from electric utility operations. Non-electric utility operations contributed 5 cents per share; other non-utility operations contributed 3 cents per share. (See Table 1.) Interest expense and charges and preferred dividend payments were up 4 cents on a per share basis.

The increased earnings were also reflected in the industry's balance sheet, as the industry's equity ratio reached 41.2 percent, up from 40.8 percent at the end of 1983. (See Table 2.) The return on average common equity increased to 14.5 percent from 14.4 percent in 1983.

Total electric operating revenues increased 9.2 percent to $119.5 billion in 1984 as the economy continued to recover from the recession of 1982–83. Total sales of electricity increased 5.8 percent to 1,736 million megawatt hours on the strength of a 7.8 percent growth in sales to economy-sensitive industrial customers.

Electric operating expenses increased 8.8 percent in 1984 to $96.6 billion. Fuel expense increased 3.7 percent to $37.5 billion in 1984 after declining 2.7 percent over the preceding two years. Even so, fuel as a percent of total electric operating expenses declined to 38.8 percent in 1984, from 40.7 percent in 1983. Non-fuel operation and maintenance costs increased 12.2 percent.

Total current and deferred income tax expenses increased 17.0 percent. The current portion of the industry's total income tax expenses (i.e., the portion accrued to be paid currently for 1984 operations to federal, state, and local governments) increased 31.5 percent in 1984 to $4.5 billion.

Electric operating income increased 10.6 percent in 1984 to $22.8 billion from $20.7 billion in 1983. Other utility operating income increased 36.3 percent in 1984 to $1.5 billion. Total utility operating income increased 11.8 percent, or 15 cents per share, to $24.3 billion in 1984. Non-utility income increased nearly 20 percent to $2.1 billion.

The quality of earnings as measured by the amount of allowance for funds used during construction (AFUDC) in net income improved in 1984. Total AFUDC increased 6.0 percent to $8.5 billion in 1984 compared to a 17.4 percent increase in 1983. However, the discontinued accrual of AFUDC by some companies due to plant cancellation undoubtedly affected the 1984 increase and put downward pressure on the annual increase in earnings. AFUDC as a percent of net income available to common shareholders declined to 49.9 percent from 53.7 percent in 1983, the lowest annual level in five years. Total AFUDC per share of common stock actually declined three cents in 1984.

Pre-tax interest coverage based on electric operations (including AFUDC) improved to 3.09 times interest charges during 1984, from 3.02 times in 1983, primarily the result of improved net income. Gross interest charges increased 9.6 percent. The improvement in the overall financial position of many utilities was reflected in the bond rating changes issued by Moody's Investor Service in 1984. Moody's raised the ratings on the senior debt issues of electric utilities 38 times in 1984 and lowered ratings 25 times.

However, common stock dividends declined on a per share basis to $2.04 in 1984, from $2.05 in 1983. Severe financial difficulties experienced by a number of companies resulted in dividend omissions or reductions in 1984 of approximately $530 million and a reduction in the industry's payout ratio to 65.3 percent from 69.3 percent in 1983. Excluding those companies from our sample, however, dividends per share increased 5.0 percent in 1984, a growth rate which is somewhat more indicative of the

Table 1

Investor-Owned Electric Utility Industry Statement of Income
For periods ending December 31, 1984 and 1983 (Unaudited) (Millions of Dollars)

	Quarter Ending December 31,			Year Ending December 31,		
	1984	1983	% Change	1984	1983	% Change
Total Electric Operating Revenues	$29,065	$26,782	8.5	$119,479	$109,446	9.2
Electric Operating Expenses						
Fuel	$8,942	$8,711	2.7	$37,498	$36,174	3.7
Other Operation & Maintenance	8,086	6,988	15.7	29,980	26,718	12.2
Depreciation & Amortization	2,407	2,142	12.4	9,229	8,370	10.3
Taxes Other Than Income Taxes	2,037	1,926	5.8	8,537	7,790	9.6
Income Taxes (Federal & Other)	826	683	20.9	4,486	3,411	31.5
Provision for Deferred Income Taxes	1,472	1,382	6.5	4,926	4,494	9.6
Investment Tax Credit Adjustment, Net	(27)	35	n.m.	1,980	1,828	8.3
Total Electric Operating Expenses	$23,743	$21,867	8.6	$96,636	$88,785	8.8
Electric Operating Income	$5,322	$4,915	8.3	$22,843	$20,661	10.6
Other Utility Operating Income	299	302	(1.0)	1,482	1,087	36.3
Total Utility Operating Income	$5,621	$5,217	7.7	$24,325	$21,748	11.8
Other Income	526	454	15.9	2,079	1,736	19.8
Allowance for Other Funds Used During Construction	1,356	1,313	3.3	5,225	4,980	4.9
Total Income Before Interest Charges	$7,503	$6,984	7.4	$31,629	$28,464	11.1
Interest Charges						
Interest on Long Term Debt	$3,617	$3,223	12.2	$13,789	$12,430	10.9
Other Interest Expenses & Charges	275	296	(7.1)	1,180	1,229	(4.0)
Allowance for Borrowed Funds Used During Construction	(775)	(789)	(1.8)	(3,247)	(3,009)	7.9
Net Interest Expenses & Charges	$3,117	$2,730	14.2	$11,722	$10,650	10.1
Net Income Before Extraordinary Items	$4,386	$4,254	3.1	$19,907	$17,814	11.7
Extraordinary Items	(54)	(204)	(73.5)	(16)	(228)	(93.0)
Net Income	$4,332	$4,050	7.0	$19,891	$17,586	13.1
Preferred Dividends Declared	733	715	2.5	2,920	2,715	7.6
Net Income Available for Common	$3,599	$3,335	7.9	$16,971	$14,871	14.1
Common Dividends Declared	2,917	2,670	9.3	11,089	10,306	7.6
Additions to Retained Earnings	$682	$665	2.6	$5,882	$4,565	28.8
Avg. Shares Outstanding	5,557	5,134	8.2	$5,425	$5,025	8.0
Earnings Per Share*	$0.65	$0.65	0.0	$3.13	$2.96	5.7
Common Dividends Per Share*	$0.52	$0.52	0.0	$2.04	$2.06	(0.5)

*Based on average shares outstanding as reported to EEI by survey respondents and adjusted for stock splits.
NOTE: Revenues are adjusted for intra-industry sales for resale of electricity.
n.m. = not meaningful

Table 2
Investor-Owned Electric Utility Industry Balance Sheet
As of December 31, 1984 and 1983 (Unaudited) (Millions of Dollars)

Assets	1984	1983	% Change
Utility Plant*			
Utility Plant (Including Nuclear Fuel)	$309,676	$279,459	10.8
Less Accumulated Depreciation	89,066	80,828	10.2
Total	$220,610	$198,631	11.1
Construction Work in Progress	95,491	93,619	2.0
Net Utility Plant	$316,101	$292,250	8.2
Investments	9,425	8,367	12.6
Current Assets	38,268	33,196	15.3
Deferred Debits	18,020	12,001	50.2
Total Assets	$381,814	$345,814	10.4
Capitalization & Liabilities			
Capitalization			
Common Stock	$81,406	$76,322	6.7
Retained Earnings	41,251	35,369	16.6
Preferred Stock	30,367	29,479	3.0
Long-Term Debt	144,344	132,278	9.1
Total Capitalization	$297,368	$273,448	8.7
Current Liabilities			
Short-Term Debt	$5,464	$5,050	8.2
Long-Term Debt Due Currently	3,638	4,013	(9.3)
Other Current Liabilities	27,815	24,835	12.0
Total Current Liabilities	$36,917	$33,898	8.9
Deferred Credits			
Accumulated Deferred Income Taxes	$25,164	$21,075	19.4
Accumulated Deferred Investment Tax Credits	14,097	12,059	16.9
Other Deferred Credits	8,268	5,334	55.0
Total Deferred Credits	$47,529	$38,468	23.6
Total Capitalization & Liabilities	$381,814	$345,814	10.4

*Includes other utility plant of combination gas and electric companies.

portion of the industry paying dividends.

The industry's balance sheet showed marked improvement at the close of 1984 compared to the close of 1983. Several factors held the growth of construction work in progress (CWIP) to 2.0 percent between year-end 1983 and year-end 1984. Construction expenditures, including AFUDC, nuclear fuel, and other utility plant declined slightly in 1984 to $36.2 billion from $36.4 billion in 1983. In addition, the placing in service of some major new generating stations and units resulted in a decrease in the ratio of CWIP to net plant in service from 47.1 percent at the end of 1983, to 43.3 percent at the end of 1984. The accounting treatment, however, of at least one major project of almost $5 billion contributed to the decrease and was also the primary reason for the 50 percent increase in deferred debits.

A number of factors contributed to lower financing requirements in 1984. The slight decline in total construction expenditures, of course, was one factor. However, an even greater factor was the improvement in internal funds generation. During 1984, investor-owned electric utilities generated an estimated 50 percent of net construction expenditures, up from 44 percent in 1983. As a result, new offerings by investor-owned electric utilities declined 14.1 percent in 1984, to $10.2 billion, according to EBASCO Business Consulting Company. In addition to the new offerings, capital provided by such common stock plans as dividend reinvestments, employee stock options, and customer stock purchases provided an estimated $3.5 billion. All of these elements, as well as additions to retained earnings from operations and other long-term liabilities, contributed to an 8.7 percent increase in total capitalization. Long-term debt increased slightly to 48.5 percent of total capitalization from 48.4 percent at the end of 1983. Preferred stock declined to 10.2 percent from 10.8 percent in 1983.

Tables 1 and 2 are based on unaudited reports submitted by a sample of electric utilities. These utilities account for approximately 92 percent of the industry's revenues from sales to ultimate customers and total assets. The data were expanded to represent the entire investor-owned electric utility industry. Data for 1983, with the exception of the fourth quarter of 1983 income statement data, were obtained from the *Statistical Yearbook of the Electric Utility Industry/1983* (Edison Electric Institute publication number 04-84-15).

Contributed by the Finance Department of Edison Electric Institute.

TECHNOLOGY REVIEW

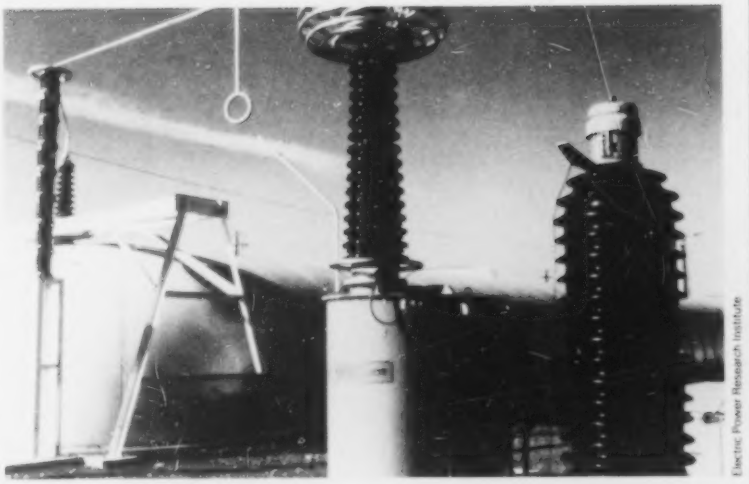
BIOLOGICAL EFFECTS OF ELECTROMAGNETIC FIELDS—RESEARCH UPDATE

The health effects of chronic exposure to electric fields, if they exist, appear to be very limited. That is the conclusion reached by scientists at the Electric Power Research Institute (EPRI) after eight years of study and more than $15 million in expenditures.

Results of part of this work will be published by EPRI later this year on a project known as Biological Effects of Electromagnetic Fields (BEEF). The project found that exposure to severe levels of electric fields—levels perceptible to experimental animals—do not produce significant effects.

The study investigated the effects of electric fields on Hanford miniature swine and on rats. Although exposed and control swine showed occasional significant differences, researchers did not see a consistent increase in birth defects. They occurred in some breedings, but not in others. The study was repeated in rats and the results were again weak and inconsistent. Teratologists—scientists who study birth defects—analyzed the data and were unwilling to accept results as demonstrating a significant effect.

"An effect was suggested in the first studies, but factors



Electric Power Research Institute

Swine housed in shed were exposed to electromagnetic fields generated by high-voltage equipment.

such as location of animal cages in the room, microcurrents or microshocks during drinking, and random variation cannot be ruled out as causative factors," reported EPRI project manager Robert M. Patterson, a member of the Institute's Health Studies Program. "Other studies involving more extreme conditions have also failed to produce an effect."

This situation has prompted EPRI to pursue studies to look for consistent effects beyond statistical noise. The additional studies, which will get under way at two laboratories later this year, will use larger groups of animals, as well as several electric field strengths—both lower and higher than those used in the previous studies.

In the BEEF study, a generation of female rats was exposed to an effective field of 65 kilovolts per meter (kv/m) for 20 hours per day for four weeks. This exposure produced body currents in the rats nearly equivalent to those a person would likely encounter standing under a 765kv line (10kv/m). The animals were then bred with unexposed males. The pregnant females were sacrificed at 20 days and their fetuses examined. Of the 22 litters from exposed rats sacrificed, one showed a malformed fetus. Litters from the 21 control rats sacrificed showed no malformations.

The results were statistically indistinguishable.

Other rats from each group were allowed to bear young to produce a second generation. These females were kept in the electric field and rebred at about seven months with a different group of unexposed males. The animals were sacrificed at 20 days for a second experiment. While there were more malformed fetuses in the exposed than in the sham-exposed group, the results again were not significantly different. Fetal examinations of the third and final teratology showed significantly more malformations, by litter, in the exposed than in the sham groups. The study was repeated again with no significant differences seen between the exposed and control groups.

It is possible that these results reveal a small, but real difference in response between exposed and unexposed rats and swine. This could occur if the field strengths used were at the lower limit of a threshold.

"Keep in mind that with any study of possible hazards, no amount of experimental effort can ever demonstrate there are no effects from electric fields. Science can rarely prove safety. There is always the possibility that just one more experiment will uncover something," explained Patterson. "The results of our upcoming studies can be weighed with those of previous studies to contribute to the consensus of whether electric fields are teratologic or not."

In addition to the swine and rat study, EPRI will also publish final reports this year on four other projects in the field. EPRI research into electric field effects on honey bees and on

plants and chicken embryos, as well as the biological effects of small air ions, will be covered. Projects extending beyond 1985 will include studies of AC field exposure and will compare electric field exposure monitoring instrumentation.

Meanwhile, EPRI is one of two U.S. organizations funding epidemiologic research into the possibility of health effects from exposure to electromagnetic fields (EMF). The American Telephone and Telegraph Company (AT&T) is providing EPRI researchers with the records of 400 workers from among more than one million employees who have been diagnosed as having leukemia in recent years. The study is designed to find out whether persons with leukemia were more exposed to EMF on their jobs than a control group without leukemia. Utility linemen jobs are of special interest because they may involve working near power lines.

AT&T was chosen to assist EPRI in its investigation of leukemia risk because the company has kept extensive and thorough employee health records. Also, AT&T wanted to assist with the research. The Johns Hopkins School of Hygiene and Public Health is the contractor.

The other organization managing two epidemiology projects is the New York State Department of Health through its Power Lines Project, which is sponsored by New York utilities. The Seattle Cancer Registry and the University of Colorado are doing the work. The Seattle project seeks to determine if incidence of leukemia among adults exposed to EMF in their homes is greater than adults in a non-exposed control group. The Colorado study will determine if exposure to measured EMF within the homes of school-age children with cancer is greater than that experienced by a comparison group of their classmates.

These projects were undertaken to provide better information to answer questions raised by the 1979 Wertheimer-Leeper report alleging a cancer risk from EMF exposure. Conducted in the Denver area, it reported an increase in cancer among children living near what investigators refer to as "high current configurations." Other investigators, with a similar study design in Rhode Island, did not confirm this finding.

Investigators here and abroad have conducted other studies on adults possibly exposed to EMF in the workplace. Occupations included electricians, welders, linemen, and power station operators. The diseases included leukemias—not always of the same kind—and brain tumors. The diversity of findings is perplexing, and further research is needed, say EPRI researchers.

Interpretation of study results is complicated by the lack of solid information on exposure levels, both in the groups suspected of being exposed to EMF and in the general population. EPRI is attempting to remedy this by funding work to design instruments that can collect exposure data, and by developing a methodology to provide estimates of annual exposures of designated groups.

Leonard Sagan, senior scientific advisor in EPRI's Energy Analysis & Environment Division, commented, "We are not saying there is no relationship between EMF and cancer. We do not know whether these prior studies demonstrate a connection or whether these are pure chance relationships. It's our responsibility to understand better whether there is a relationship between electric fields and health effects, though the evidence of causation so far is not persuasive." There is neither theory nor a body of animal data that would support a cancer-promoting effect of EMF, he added.

"As a matter of environmental health, the effects on humans exposed to EMF deserve EPRI attention, and projects are underway to provide better answers. But, most knowledgeable observers conclude there is insufficient evidence to justify mitigating or remedial steps," he said. EP

Contributed by the Public Information Department of the Electric Power Research Institute.

STATISTICAL REVIEW

1984 SALES UP

Sales of electricity to ultimate customers by investor-owned electric utilities totaled 1.736 billion megawatt hours (mwh) in 1984, up 5.8 percent from 1.640 billion mwh in 1983. (See Table 1.)

The primary force behind the growth was the growth in the nation's economy. During 1984, the Federal Reserve Board Index of Production (less the electricity component) increased 10.7 percent, compared to a 6.5 percent increase in 1983. In response to the growth in industrial activity, sales of electricity to industrial customers increased 7.8 percent in 1984, accounting for almost half of the total electricity sales growth for the year. However, the rate of growth in sales to industrial customers slowed in each successive quarter during 1984.

Sales to residential customers increased 3.2 percent in 1984, the greatest percentage annual increase since 1980. (See Table 2.) Colder than normal winter temperatures and a 1.8 percent increase in the number of ultimate residential customers created the majority of the increase. Sales to commercial customers increased 6.1 percent, and the number of commercial customers grew 2.4 percent.

Total net generation by the total electric utility industry increased 4.5 percent in 1984 to 2.413 billion mwh. Additional sources of electricity experienced even greater increases. Net imports increased 9.9 percent to 39.3 million mwh, and purchases from industrial sources increased 17.8 percent to 15.0 million mwh.

Table 1
Electricity Sales and Economic Activity, 1983 to 1984 (Percent Change)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Year
Change in Sales to Industrial Customers	12.8	10.9	5.6	2.7	7.8
Federal Reserve Board Index of Production	15.4	12.9	9.1	6.1	10.7
Change in Sales to Total Ultimate Customers	11.5	8.7	1.3	3.0	5.8

Table 2
1984 Customer and Sales Data, Investor-Owner Electric Utilities

	Twelve Months Ended December 31, 1984	1983	% Increase
Number of Customers			
Residential	66,326,642	65,147,198	1.8
Commercial	7,998,038	7,809,824	2.4
Industrial	397,060	387,570	2.4
Street & Highway	112,298	114,608	(2.0)
Other Public Auth.	138,676	137,647	0.7
Railroads	24	23	4.3
Interdepartmental	460	472	(2.5)
Total Customers	74,973,198	73,597,342	1.9
Electricity Sales (mwh)			
Residential	563,334,705	546,114,622	3.2
Commercial	473,209,995	446,037,128	6.1
Industrial	643,432,620	596,739,365	7.8
Street & Highway	10,148,950	10,449,208	(2.9)
Other Public Auth.	40,997,850	36,412,645	12.6
Railroads	2,055,413	1,929,257	6.5
Interdepartmental	3,171,950	2,817,046	12.6
Total Sales (mwh)	1,736,351,483	1,640,499,271	5.8

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